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MATERIA MEDICA
OR
PHARMACOLOGY
AND
THERAPEUTICS.

BY WILLIAM TULLY, M. D.

VOL. 1 PART 2.

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IGNORANCE is preferable to error ; and he is less remote from the truth who believes nothing, than he who believes what is wrong."—*Jefferson's Notes on Virginia.*



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dinary and habitual use of Tobacco so common in our country at the present time. In the preceding enumeration of the several different and distinct powers of *Nicotiana Tabacum*, I did not mention the two comparatively unimportant ones called Errhine and Esstomatic, both (as these terms imply) exerting their operation by application to the nostrils and the mouth. Any morbid effects, that may result from these, need no more be mentioned here than the morbid effects of the Euphrenic power, since we are here treating only of the morbid effects of a Narcotic power. It is necessary to add here that it is neither for the Narcotic, Adenagic, Emetic, Cathartic, Errhine or Esstomatic power of *Nicotiana Tabacum*, that it is taken habitually and protractedly; nor does the *Limosis Syncoptica*, which occasions all the difficulty of relinquishing such habitual and protracted use, result in any degree, from any one, or more of the above specified powers, as I trust I shall show in the proper place. Nor do any of the morbid effects of the habitual and protracted use of Alcohol and Wine (two materially different chymical compounds) result in any degree, or depend at all, upon their Narcotic power. If the habitual and protracted use of *Papaver* ever produces any morbid effects (and I do not think that it produces any, except *Limosis Syncoptica*) we may rest assured that they are never occasioned by its Narcotic power.

Much is said of "the Narcotics we indulge in;" and there are three papers upon this subject, in as many numbers of Blackwood's *Edinburg Magazine* for the year 1853, in which about thirty articles, supposed to be of this character, are specified and treated-of, twenty-four of which may be shown to be utterly and intirely destitute of all Narcotic power, and four of the remaining six are never popularly used habitually, continuously and protractedly for their Narcotic operation. I have seen very large, and almost incredible quantities of various preparations of the strobiles of *Humulus Lupulus* or Hop (one of the articles named among "the Narcotics we indulge in") swallowed within a short time, without the least indication even of the most trifling Narcotic operation; so that I have been long perfectly well satisfied that it is in reality no more Narcotic than the shavings of the edges of the leaves of books, in a book-binder's shop; and yet a writer, who would fain persuade the world that Small-Beer is

more deadly than the Bohun Upas of Java has ever been represented to be, says "unlike all other intoxicating drinks used for a common beverage, Beer contains, by means of the Hop, a deadly Narcotic, an Anodyne with its Alcoholic Stimulant, and thus impairs, distracts and racks the nervous system more fatally, by means of acting upon it by conflicting and contrary agencies." An other writer says "an other evil exists in society, to a greater extent perhaps, than we are aware of—an increasing consumption of Stimulating and Narcotic drugs, even when the various forms of Alcohol have been laid aside." "This is a practice fraught with danger to health and morals; and is only to be successfully met, in its incipient stage," etc. This very properly and very truly deserves to be called by the vulgar and low denomination of humbug. I insist that there are no Narcotics in habitual and protracted use in our country, except Papaver, Wine and Alcohol. Papaver is not so used for its Narcotic operation in any case except when the patient is diseased and suffers pain, when it is pushed to the production of the Anodyne grade of a Narcotic operation—a perfectly legitimate use of this article. Papaver is utterly incapable of producing any grade of Intoxication, and consequently can not be used for this effect. Wine and Alcohol likewise, are never used habitually and protractedly for their Narcotic operation, nor can any Narcotic effects be produced by them, under this method of employment, unless actual Intoxication takes place; and even then, no injury results from the Narcotic part of a drunken fit; unless so much Alcohol is swallowed at once as to endanger life or actually destroy it. It is by no means the Narcotic part of the operation of Alcohol or Wine, that produces the mischievous effects of intemperance in the use of these articles; nor are these mischievous effects by any means the same, as produced by Wine and Alcohol respectively. When I reach the classes, whose power produces the morbid effects of a habitual and protracted use of a large quantity of Alcohol or a still larger quantity of Wine I shall point it out.

The Narcotics appear to me to operate, but not equally, upon every subordinate part of the nervous system. Some appear to operate much more especially upon the nerve of chymical action, nutrition and reproduction; and when pushed so far as to destroy life, they accomplish this, by suspending the functions of this

nerve. As examples of this group we may mention the following viz. 1. *Antiaris toxicaria* (*Leschenault*) whose active principle consists of a compound radical of ten equivalents of Hydrogen and fourteen of Carbon, either basified or acidified by five equivalents of Oxygen. If it is a salifiable base, it can not be an Alcaloid, as it contains no Nitrogen. As a base it would require a name terminating in *a* or *ia*, as *Antiaria*. If it contained Nitrogen and were an Alcaloid, *Antiarina* would be its appropriate name. If it is an Acid its appropriate name will be *Acidum Antiaricum*. 2. *Nicotiana Tabacum* (*Linn.*) which contains the compound radical of an Alcaloid consisting of eight equivalents of Hydrogen, ten of Carbon, and one of Nitrogen. This compound radical is not active, but by particular treatment of the dried leaves of the plant, it combines with Oxygen (how many equivalents I can not now recollect) and becomes active. This principle acts more especially upon the nerve of chymical action, nutrition and reproduction, and destroys life by suspending its function. I shall hereafter mention an other factitious Narcotic principle made from Tobacco, which operates more especially upon an other subordinate part of the nervous system. 3. *Digitalis purpurea* (*Linn.*) which contains an Alcaloid operating more especially upon the nerve of chymical action, nutrition etc. and destroying life by suspending its function. 4. *Aconitum Napellus* (*Linn.*) et variae aliæ species; which contain an Alcaloid operating in this manner.* 5. *Ætherogenii Protoxydi Unihydris vel Alcohol absolutum*, is an other article which operates in the same manner as a Narcotic.† These will suffice as specimens of this set.

Whether the suspension of the function of the nerve of chymical action, nutrition and reproduction, as produced by these and numerous other Narcotics not here particularized, is connected with exhaustion or prostration, I do not consider as certainly ascertained; but I judge from the analogy of the suspension of the function of the nerves of expression, by an other set of Narcotics,

* A different account has been given of the manner in which Aconite destroys life; but there is ample printed authority in favor of the view here given, and I have besides had private testimony to the same effect.

† Alcohol is mentioned by Brodie as destroying life in a different manner; but I have had the amplest and most satisfactory testimony to what I have stated above, so that I can not think there is room for any reasonable doubt upon the subject.

that it is prostration and not exhaustion. This knowledge is of great importance in relation to the saving of the life of the patient, since what is done, must be done quickly, and it must be that which is right, or it will not answer the purpose. From the best information that I possess, a speedy and free use of Alcohol promises the most as a remedy, of any article within my knowledge. This is founded mainly upon the hypothesis that the morbid condition is connected with exhaustion. Even admitting that it is prostration, Alcohol will be appropriate, for it is as much Oresthetic as it is Antisbestic, and besides, it is about equally Euphrenic. Now both Oræsthesia and Euphrænia are well adapted to relieve prostration. If the suspension of function is really and truly connected with prostration, the Oresthetics will be more or less useful; and of these, I should think that Capsicum would be the best. If the suspension of function depends upon exhaustion, the Oresthetics will be of little service. They may possibly increase the susceptibility to the influence of the Antisbetics, and that is all. I can not but think, however, that these cases result from prostration and not exhaustion. If so, Euphrenics and Erethistics will be capable of rendering service if administered with sufficient promptitude and efficiency.

Some of the Narcotics appear to operate much more especially upon the nerves of expression and respiratory motion; and when pushed so far as to destroy life, they accomplish this by suspending the functions of this set of nerves. As examples of this group, we may mention 1. *Strychnos toxifera* (*Bentham*); 2. *Strychnos cogens* (*Bentham*); (according to De Candolle, but contrary to others;) 3. *Rouhamon Gujanense* (*Aublet*); 4. (*Rouhamon*?) *Curare* (*De Candolle*) the active principle of all of which is an Alcaloid called Curarina or Curarine; 5. *Cyanogenium* (*purum*); 6. *Hydrogenii Cyanidum*, et varia alia Cyanida; 7. *Acidum Benzhylohydricum*, *Hydrogenii Benzhylidum*, *Oleum essentielle Amygdali communis*. 8. *Nicotiana Tabacum* (*Linn.*) *Oleum empyreumaticum factitium*. 9. *Conium maculatum* (*Linn.*) the active principle of which is an Alcaloid called Coniina. 10. *Papaver somniferum*, which has several active principles, most if not all of which are Alcaloids. These will constitute a sufficient specimen of this sort of articles.

In cases of the suspension of the function of the nerves of expression by the Narcotics which I have particularized, and doubt-

less numerous others, I am well satisfied that the suspension is due to prostration and not exhaustion ; and I doubt not that factitious respiration carefully and skilfully performed and kept-up, till the effects of the Narcotic have had time to pass-off, would in all cases save life. This has been repeatedly tried upon brute animals, and with perfect success. After what would otherwise have been a mortal inoculation with Extract of *Strychnos toxifera*, so large an animal as an Ass has been made to recover, by keeping-up factitious respiration for many hours, i. e. till the effects of the Narcotic had wholly passed-off. In suspensions of the functions of the nerves of expression, as produced by certain Narcotics, I am satisfied that the Oresthetics and Erethistics contribute to a valuable degree, to bring them into action again. Some of the best articles of these classes of remedies should always therefore be employed, not to the exclusion of factitious respiration, if the case is a bad one, but in aid of it. A few of the slight and comparatively trifling cases, may however be trusted to these articles alone.

Long before they have been pushed so far, as in the least degree to endanger life, all the Narcotics produce some symptoms, in subordinate parts of the system, the integrity of whose functions is not at all essential to life, which if they are properly understood, will always serve to warn us, as to the extent to which the article may be pushed, not only without the least hazard, but even without inconvenience. Those which destroy life by exhausting the powers or suspending the functions of the nerves of expression and respiratory motion, always produce what appears to be coma, long before they disturb the function of the system of nerves just specified. Indeed, some physiologists, with but an imperfect and incorrect knowledge of the nervous system, have supposed that this set of Narcotics actually destroys life by means of exhausting the powers, and suspending the functions of the hemispheres of the cerebrum. They seem to have arrived at this conclusion from observation of the fact, that coma always precedes danger from this set of Narcotics, and that the coma must become exceedingly intense, before the danger is at all imminent. But it is now known, that the functions of the hemispheres of the cerebrum are not immediately essential to life; and that a human being may live without any cerebrum at all, till he dies of starvation at least.

What is the real and true nature of the suspension of the function of the hemispheres of the cerebrum, which is produced by the Narcotics? As appears to me, it is undoubtedly true and proper coma. It will at once be obvious that a suspension of the functions of intellect, of special sensation, and of voluntary motion, all of which are inactive, without activity of the cerebrum, could destroy life in no other way than by starvation consequent to the inability of taking food, which it would produce. It will be equally obvious that a suspension of the function of common sensation could never destroy life.

The manifestations of the operation of the Narcotics upon the cerebrum, I suspect, have their ultimate seat in the nerves of the blood-vessels of that viscus or organ; and as these manifestations consist both in sensations and in motions or actions, it would seem as if they must have their seat both in the nerves of common sensation, and in the nerve of chymical action, nutrition and reproduction, as distributed to the blood-vessels of the cerebrum, these being (as I suppose) the only nerves, with which these blood-vessels are furnished, and this being the only nervous connexion between the alimentary canal and the cerebrum. As the cerebrum itself is insusceptible either of common sensation or of motion or action from the immediate and direct contact of a Narcotic with its proper substance or parenchyma, it would be useless to suppose actual contact of the Narcotic, from its being conveyed in substance, in the blood-vessels, and deposited by extravasation within this organ. It is well known that the nerve of chymical action, nutrition and reproduction, is distributed much more profusely to the blood-vessels of the contents of the cranium, than to the blood-vessels of any other part. This nerve actually forms a network around the primary carotid, from its origin to its bifurcation, and then continues to do the same along the internal carotid, until after it enters the cranium.

If, with most writers on the classification of the *materia medica*, we should reckon *Ignatia amara*, certain *Strychni* and numerous more or less analogous articles, as Narcotics, it would be necessary to specify an other subordinate part of the nervous system as more especially acted-upon, and an other mode in which life is destroyed; but as I do not view these articles as true and proper Narcotics, and as I refer them to an other materially different

that was so called, is incapable of destroying life at all ; and the other four suspend the functions of the nerves of expression and respiratory motion, the action of the heart and arteries some times continuing for hours afterwards. It is probable that in all cases of a suspension of the function of respiration from Cyanogen and its compounds, life might always be saved by keeping-up factitious respiration till the effects of the Narcotic have passed-off. This has been certainly ascertained in regard to all those articles which depend upon Curarine for their activity ; and Curarine is more active than Cyanogen and its compounds, at least when employed by inoculation. Good speaks of the plants that contain Prussic Acid. There are none that contain either of the six substances that have been so called, any more than there is Rye that contains Alcohol. Whence he could have derived such notions I can not possibly conjecture. It is very evident from the perusal of Good's Study of Medicine, that the author knew very little of the Narcotics, as articles of the *materia medica*. In fact, it is plain that he entertained scarcely a correct notion about them.

In consequence of opinions widely prevalent at the present period, it seems to be necessary to say a few words concerning the relation between Narcotics and Congestion. Ever since the writings of John Armstrong have exerted so much influence upon the pathological views of the British and United States Medical profession, Congestion seems to have had a new and extraordinary importance attached to it, which has greatly affected both *materia medica* and therapeutics, as well as pathology. It is now not only reckoned as the essential cause, but also as the essential pathological condition of numerous diseases, it being esteemed the instrument, by which numerous diseases destroy life. Indeed, according to the late bills of mortality, it is very often an independent disease of itself, occurring without connexion with any other pathological conditions, and very often producing death. For several years past, when ever I have inquired after the disease of any one who has recently died, the answer has been (I think in a majority of cases) Congestion ; so that, if I had given full credit to these replies, I should have come to the conclusion that it is the most widely prevalent, and the most fatal disease of the times.

But, it may be inquired what connexion this has with the Narcotics ? I answer that much the largest portion of all the physicians,

with whom I have had opportunity to converse, for a considerable number of years past, seem to have had no other notion of a Narcotic than that it is an agent, which "occasions a determination to the brain." On inquiring what is intended by this phrase, the reply has uniformly been, that it means "a preternatural and disproportionate transmission of blood to the head." Now I never witnessed a case in my whole professional life, in which I could find any reason to conclude that a medicinal grade of the operation of any simple and pure Narcotic, ever produced "a preternatural and disproportionate transmission of blood to the head;" and I never could find the least evidence that such an operation ever makes a part of the regular effects of any Narcotic whatever, unless perhaps it may be under the operation of inordinate and dangerous doses. Since the time of John Armstrong, so much, and such undue importance has been attached to Congestion, that no account either of any single remedy, or any class of remedies, or of any disease, is considered by many as at all complete, unless its relations with Congestion are pointed-out. Now I have long been well satisfied, both from observation and from principle, that no agent ever produces a general visceral congestion, which does not diminish vital energy and strength of action in the heart and arteries, and probably in the whole sanguiferous system; and that nothing produces Congestion in any individual viscus, which does not diminish the tone of such viscus. I do not think that any simple and pure Narcotic, in any medicinal grade of its operation, ever impairs vital energy and strength of action, either in the heart, capillaries or any other part of the sanguiferous system. Even when pushed so far as to suspend the function either of the nerve of chymical action, nutrition and reproduction, or that of the nerves of expression, there are the best reasons for believing that the Narcotics produce only prostration, and by no means exhaustion. But these reasons I have already given else where. If such are the facts, simple and pure Narcotics can not possibly produce general visceral congestion; and much less congestion in a particular individual viscus.

Local visceral Congestion from Phlogosis, as appears to me, can not possibly be produced by any pure and simple Narcotic. This is too obvious to require examination, or even any degree of consideration. As to general superficial Congestion, I consider it

certain that it can not be produced without a general increase of vital energy and strength of action in the heart and arteries. This I am sure that no simple and pure Narcotic ever produces. Topical superficial Congestion of any other sort than from Phlogosis, appears to me to be impossible from any agent taken internally. It must be obvious that those Narcotics, which have other powers conjoined, must operate in regard to Congestions, exactly as those other powers would operate, if possessed alone by an agent. But I attach very little importance to the subject of Congestion, since (as appears to me) it is always a mere effect of some thing of far more consequence, itself being of very little consequence. As appears to me, there is no universal disease, which does not to a greater or less degree vary the relative distribution of the blood between the external and internal parts. Indeed, I doubt not that such variations in a much less degree, are constantly occurring in a state of health, without disturbing such health in the least; and when they occur in the highest degree, as the result of disease, they do not endanger, and much less destroy the life of the patient but are the mere effect of extreme exhaustion, which causes death instead of the Congestion. The general Congestions therefore, that occur in fatal diseases, are always internal, and always produced by exhaustion, and the fatality results from the exhaustion and not from the Congestion. The topical Congestions that are found in fatal diseases, I believe, are always the effect of Phlogosis of some sort or other, or of some other local disease which produces exhaustion in some viscus or organ whose functions are necessary to health or even life. Now I repeat, it is not the Congestion which occasions the fatality; but the Congestion and the fatality are equally the result of the exhaustion.*

The several different terms by which this class has been designated at different times, by different authors are the following, viz.:

Torpentia. This is one of the translations into Latin of the term *Narcotica*, and on the whole, not as true a translation as the term *Stupefacientia* would have been. In as much as Latin is

* In the Boston Medical and Surgical Journal, No. 23, Vol. VI., Wednesday, July 18th, 1832, I published an abridgement of an Essay on Congestion, which I beg leave to refer to, for my principles on this subject. The original from which this was abridged has been long since lost.

more easily and more generally understood than Greek, the inappropriateness of both of these terms is much more obvious than that of *Narcotic*. But even if these terms were much less exceptionable than they actually are, they could not be employed under the existing rule that the names of the classes must be of Greek origin.

Nervina. The vague term *nervine*, as ordinarily used, is on the whole, perhaps oftener applied to the Antirritant grade of a Narcotic operation than to any thing else, or than any other term, though I believe that the first two or three grades of a Euphrenic operation are always designated by this term, whenever they are noticed. Whenever an other physician has been with me at the bed-side of a patient, I have watched carefully his use of this, as well as other terms; and as we much oftener require, and therefore much oftener witness the Antirritant grade of a Narcotic operation, than the first two or three grades of a Euphrenic operation, so this term is much oftener thus applied; but whenever the first two or three grades of a Euphrenic operation are observed, this same term is always applied to them, if they are called by any name. This term has been applied to one-third at least of the classes of my first nexus. From its intrinsic signification, it is just about as applicable to one of them, as an other. Its vagueness of signification would not however be so objectionable, if it were not constantly applied with equal vagueness. Even if it were pure Greek, it would be a spoiled term; but being Latin it is not at present to be tolerated as the name of a class of the *materia medica*.

Sedantia et Sedativa. If these terms were not objectionable as names of this class, on the ground that they are pure Latin, they would be inadmissible on the score that this class does not contain all the Sedatives, and that from their intrinsic import, they are very nearly as applicable to some other classes as to this.

Infirmantia. This term is inadmissible on the ground that it is pure Latin; but still more so on account of its intrinsic import. I consider it as very certain that the Narcotics are by no means exhausting or debilitating agents, though I am apprised that this opinion has been strenuously maintained by some distinguished members of the profession.

Anodyna. This term is legitimate Greek, and is not therefore

objectionable on this ground, as a name of this class. But it denotes only the second grade of a Narcotic operation. The employment of such a name would require a division of this class into three classes at least, if not four, all founded upon one single power.

Hypnotica. This term is pure Greek, and unexceptionable on this score. But it denotes only a single grade of the operation of articles of this class, viz. the third. The adoption of this term as the name, would require a division of the class into three classes at least, all founded upon one power. The term Hypnotic is the Greek of Soporific or Soporiferous.

Soporifica et Soporifera. These terms are pure Latin, and therefore inadmissible as names of a class. But they denote only a single grade, viz. the third, of a Narcotic operation. As I say with regard to the term Anodyne, these terms would require a division of the class into three classes, all founded upon one single power. These terms are the Latin equivalents of Hypnotic.

Inebriantia et Intoxicantia. The terms Inebriant and Intoxicant have been employed as names of this class; and when so applied, they have been used with such latitude as to comprise my Erethistics, Euphrenics and perhaps Oresthetics and Antisbestics. I do not think that any body would apply these terms to the last two classes fairly separated from the Narcotics and the Euphrenics; but to the whole five classes merged into one, as according to John Murray, and various others, these terms are often applied. All articles that are reckoned as Stupefiers are invariably considered as Inebriants or Intoxicants. I could probably turn to a thousand instances in the books of my own library, in which Stupefiers and Inebriants or Intoxicants are mentioned as the same; and the term Stupefier is truly considered as a translation into Latin of the Greek Narcotica. If Inebriantia and Intoxicantia were not objectionable on other grounds, they would be, on the score of being Latin. It is true that Intoxicantia is derived from a Greek word; but as Greek it has a widely different signification from its Latin import. Its theme or root in Greek signifies a bow; an arrow; and all its derivatives in Greek have relation to these; but in Latin it means a Poison; or Inebriation. Both parts of the word toxicologia or toxicology are Greek, and therefore this term should have its Greek signification, viz.

that department of knowledge, which relates to bows and arrows. Pharmacology is the proper term for that department of knowledge which relates to Poisons.

Cerebro-spinantia. This strange term has been employed by some French writer or writers, I now forget whom, and also by Pereira, as a name for this class. It may be said to be in all respects absurd. The action of the Narcotics is by no means confined to the cerebrum and the spinal cord, but it is equally manifested in the great sympathetic so called. But it is not probable that, by this term, it was intended to exclude the great sympathetic from their influence. If such is the fact, it renders this term just about equivalent to the term Nervine, which seems to me to be intrinsically far preferable. But the term Cerebro-spinant is Latin, and falsely formed in addition, since *o* is the combining termination of Greek words, and *i* of Latin words. It should have been Cerebri-spinant. But how absurd is brain-spinning (the exact English) as a name of a class of medicines. Cephalorachidiana (the translation into Greek) would have been rather more capable of being endured, and this is all that can be said of it with truth. If we admit this term we shall need Voluntary-nervant for Ignatia amara, Strychnos Nux-vomica, etc. Expressant for Cyanid of Hydrogen, Curarina, etc. Sympatheticant for Antiaris toxicaria, Nicotina, etc. But it is to be earnestly hoped that medicine will be delivered from such a jargon as this.

It is a common mistake with authors and practitioners to suppose that all the effects of certain Narcotics (which really possess several different and distinct powers) are due solely and exclusively to their Narcotic power. For example, all the effects of Papaver are generally supposed to result from its Narcotic power merely, though in reality, this article possesses at least five different and distinct powers, though not equal in intensity.

I know of no natural Antiphlogistic-Narcotic. We possess a number of factitious compounds of Cyanogen with Potassium, Sodium, Calcium and Magnesium, that would be Antiphlogistic as well as Narcotic, if the degree of their Narcotic power would allow a sufficient amount of the compound to be administered to produce an Antiphlogistic effect; for all the compounds of these elements are Antiphlogistic, when there is nothing to prevent a

patient from taking a sufficient quantity to operate in this manner.

I know of no natural Nausiatic-Narcotic, that is available in medicine, for both these powers in conjunction. I shall hereafter mention articles that are Nausiatic, Emetic, Cathartic, etc. which are considered to possess a certain degree of Narcotic power, but yet are not worthy of being specified in this place.

There is no article in present use, that seems to be a natural Leantic-Narcotic. I should think it quite probable that there might be many such in existence; but if there are, they are not yet generally known, and much less introduced into the *materia medica*.

There are no natural Neuragic-Narcotics at present known; but there are factitious ones. It will be sufficient in this place to mention Protocyanid of Lead, Protocyanid of Zinc, etc. I do not think that even these are ever prescribed for their Neuragic, in conjunction with their Narcotic operation; but when their use is continued for a long time, they doubtless prove more or less Neuragic.

An Erethistic power is some times associated with a Narcotic power, without constituting any part of such Narcotic power. Although I shall define Erethism more fully else where, yet it is necessary to give a brief explanation of it in this place, since it is less known, and as I think, more difficult to be understood, than the other powers which I shall select for illustration. There is then an operation exerted by certain Narcotics (and as some suppose, capable of being exerted by the whole, though this last opinion I consider a great error) which is often to be observed, and which is commonly called Stimulation, though widely different from what I call Antisbesis, from what I call Oræsthesis, and from what I call Euphrasia or Euphrænia, all of which are universally called Stimulation also. The operation to which I refer, I have long been in the habit of denominating Erethismus or Erethism. By Erethism I always understand a preternatural, and perhaps more or less morbid degree of activity, and a more or less augmented, and some times excessive exertion of the powers and energies by which any function is discharged. An Erethistic agent (but by no means an Antisbestic or Tonic one) may be correctly compared to the whip and the spur, which do not indeed

give any additional power or energy, but only bring into more powerful action, that which already exists, which was not previously exerted, and which perhaps was latent or prostrated.

This peculiar operation has been generally considered as a part of a Narcotic operation. It is not however, a regular grade of Narcosis, nor is it by any means producible by all the Narcotics. That however which amounts to an experimentum crucis upon this point, is the fact that this power is possessed in a more eminent degree, than by any Narcotic, by a considerable group of articles, which are intirely destitute of every grade of Narcotic power of any quality whatever. In short, I have the fullest conviction of the perfect distinctness of Narcotic and Erethistic powers; and when the latter happens to be possessed by an unequivocal Narcotic, it is to be reckoned as a different and as a perfectly distinct power, as much so as a Euphrenic, Oresthetic or Antibestic power, or any other power, that ever happens to be associated with that of a Narcotic, as much even as that of an Emetic or a Cathartic.

An Erethistic effect, when this power happens to be possessed by a Narcotic, is producible in a prominent degree, only when such Narcotic is managed in a peculiar manner. Under the ordinary modes of management for Narcotic effects, the Erethistic operation is but little, or not at all perceived. Such is not the fact with those Erethistics which are intirely destitute of all Narcotic power. A single one of the grades of a Euphrenic operation might perhaps accord sufficiently well with the definition of an Erethism; but then it would be an Erethism of a very different quality; and certainly it is not admissible to reckon the several grades of the operation of a single individual power, as different and distinct operations. A part of the effects of an Oresthetic power might perhaps be reckoned as an Erethism; but here also, it is an Erethism of a widely different quality from that of a true and proper Erethistic; and it is no more admissible to rank a single grade of the effect of one power, with the whole effect of an other power. Does not the whole peculiarity of those articles, that are commonly called Acrid-Narcotics, consist in the circumstance that they are Erethistic, some times with a Narcotic power, and some times without one? These articles are seldom directly Antirritant or Anodyne, and I believe never Soporific. This looks

very much as if they are not Narcotic at all. But perhaps some of them may be, in a greater or less degree, exceptions to the above statement.

For the production of the Erethistic effects of any Narcotic possessing an Erethistic power, it must be administered in equal and uniform doses, at regular and very short intervals, the doses and quantity in the twenty-four hours being so large, that the patient shall take as much of the article employed, as is practicable, without producing Ultimate-Narcosis in a decided degree. There are many subjects in whom the susceptibility of the hemispheres of the cerebrum and their immediate appendages is far greater than the susceptibility of the nerve of chymical action, nutrition and reproduction; so that the Euphrenic, Antisbestic, and Erethistic Narcotics, such as Papaver, Camphor, Myristica, Binhydrite of Protoxyd of Etherogen, etc. can scarcely be employed in sufficient quantity to relieve many diseases of the latter without producing an Erethism of the former.

The peculiarities of the Erethistics, in contradistinction from Narcotics, consist in the facts that they can not be used as direct Antirritants, or direct Anodynes, and that they never prove Hypnotic or Soporific, but are not infrequently productive of a preternatural wakefulness. They never produce coma, but not infrequently contribute to relieve it. I have very often used them successfully for its prevention and relief. At the same time, there is no sort of opposition between the Antirritant and Anodyne effects of a Narcotic, and any of the effects of an Erethistic, though I think there is truly an opposition between the Hypnotic or Soporific effects of a Narcotic and probably the whole of the effects of a pure Erethistic. One of the ultimate effects of a pure Erethistic is stupor of the hemispheres of the cerebrum; but stupor is a very different condition from coma, and much more from sleep, as I should think any body might easily understand, who has ever felt stupor of an extremity. No better example can be given of an unequivocal Narcotic, which possesses an Erethistic power, than Papaver. I have not infrequently had occasion to prescribe for patients, who were so susceptible of Erethism, that a sufficient quantity of Papaver to answer the common indications for this agent, could scarcely be given, without the production of an undesirable and disagreeable degree of Erethism; and in very

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many cases, in which large quantities of Papaver are necessary to reach and restrain urgent and dangerous symptoms and conditions, an undesirable degree of Erethism may take place, in any subject, and even in those not preternaturally susceptible of this operation.

A Euphrenic power is some times associated with a Narcotic power, without constituting any part of such Narcotic power. Here again Papaver furnishes one of the best examples of an unequivocal Narcotic, with a Euphrenic power conjoined, which is generally, I think I may say universally, reckoned as part and parcel of its Narcotic power, though in reality it is just as different and distinct as the Emetic and Cathartic powers of *Nicotiana Tabacum* are different and distinct from the Narcotic power of that article. This Euphrenic power, with its operation and effects, are some times very prominent when no appreciable amount of its Narcotic operation exists. A paroxysm of *Cephalodynia nauseosa* or Sick-Head-ache will some times continue for thirty-six or forty-eight hours, in which the patient will vomit frequently, and will take no food whatever, during the whole time. At last, the paroxysm will terminate rather suddenly, leaving the subject in a state of inanition, with very considerable preternatural susceptibility. Under these circumstances, a small quantity of Papaver—a quantity insufficient to produce any appreciable Narcotic effects, will prove prominently Euphrenic. About the same amount of Euphrænia, accompanied with no more Narcosis, may often be witnessed in small children, when in a state of considerable inanition. Now this is certainly no part of a Narcotic operation, as is commonly believed, since many Narcotics are utterly incapable of producing any degree of it; and many articles not at all Narcotic are capable of producing a much greater degree of it.

The Euphrenic effects of Papaver are always called its Stimulant effects, while the latter are very often wholly overlooked. Very often indeed have I heard its Euphrenic effects specified in proof of its Stimulant power, while the increase of vital energy and strength of action in the heart and arteries (the effect of its real Antisbestic power—a power perfectly different and distinct) is intirely overlooked. All of these effects thus mistaken, may be produced in a higher degree, by other agents, without a particle of the increase of vital energy and strength of action. I have

of medical gentlemen, how many different and distinct powers they supposed were possessed by Camphor, Poppy, Wine and Alcohol? As I have said in an other case, the question has always been listened to with some surprise, while the answer has always been, one and one only.

It is doubtless within the knowledge of all my readers that it is comparatively a few years only, since the question was much discussed whether the Narcotics are primarily and essentially Sedatives or Stimulants? Nobody seemed to think it possible that any of them could be both, at one and the same time. It is doubtless well known to every member of the medical profession, that some of the older physicians once maintained that the Narcotics first proved Sedative and then Stimulant, the Stimulation being the result of the struggle of the "*vis medicatrix naturæ*" against the Sedation. This doctrine was superseded by the still more acceptable one that the Narcotics were primarily Stimulant, and secondarily Sedative, the Sedation being the necessary effect of the Stimulation—a sort of Brunonian indirect debility, produced according to the supposed law that Stimulation must of necessity diminish vital energy and strength of action secondarily, as much as it augmented them primarily. In this discussion it must be observed that Erethism, Euphrenia, Oræsthesia and Antisibesis were all confounded on the one hand; while on the other, the same was equally true of Sedation, prostration and exhaustion. The first four were called Stimulation; and to this term was some times given a much wider latitude, it being occasionally made even more comprehensive than the whole *materia medica*. The last three were all merged in debility, and some times this term was likewise made much more comprehensive. Now my attention has been long turned to this subject; and if any thing can be established by observation and experience, it is the fact that there are a multitude of Narcotics, that are utterly incapable of producing any degree either of Erethism, Euphrænia, Oræsthesia or Antisibesis, as I define these terms. It is equally a fact established by observation and experience, that there are other Narcotics which, with the power, operation and effects, that constitute a simple Narcotic, produce either Erethism, Euphrænia, Oræsthesia, or Antisibesis, in addition. There are some others, which possess various combinations of these powers, along with their Narcotic

power; and there are others still, which possess the whole of them, with some additional ones. Alcohol is certainly Erethistic, Euphrenic, Oresthetic, Antisbestic and Diaphoretic in addition to its Narcotic power.

Wine, Papaver and Camphor, possess the same powers by name, with the single exception of the Oresthetic power. Now there are numerous articles possessing all these powers separately, or in different combination, which is conclusive that they are different and distinct powers. I think I may safely say, that hundreds of times I have seen Sedative effects and Antisbestic effects in conjunction. Who has not seen a great abatement of morbid irritability and irritation and irritative actions generally; morbid mobility, restlessness, jactitation and sleeplessness, at one and the same time that vital energy and strength of action in the heart and arteries is very decidedly increased? The physician who has never seen this, can never have seen Papaver and Alcohol given with any efficiency, in the cases to which they are especially adapted, and in which they are in fact absolutely necessary. In fact, I have seen unequivocal Antisbestic in conjunction with a moderate degree of Ultimate-Narcosis; though a high degree of the latter is certainly incompatible with any thing like a high degree of the former.

For the production of the Antisbestic effects of any Narcotic possessing this additional power, the article must be administered in equal and uniform doses, at regular and what will doubtless be considered very short intervals, the doses being so large that the patient shall take as much as is practicable without the production of ultimate Narcosis, in any decided or undesirable degree, and also without producing any decided or undesirable degree of Euphrasy (Euphrænia) or Erethism, provided the article possesses these additional powers, as is almost always the fact with the Antisbestic Narcotics.

But some find great difficulty in admitting that there can possibly be any such effect as direct Sedation, from any article of the *materia medica*. Medicines (it is said) must, by their impression upon the living solid, produce a new action, which must be an additional action, and consequently an increased action; and this, (it is alleged) is Stimulation and not Sedation. For myself however, I never could discover why, the impression of a medicine

might not directly diminish morbid irritability and irritation, and irritative action; morbid mobility, restlessness and jactitation; at the same time suspending pain and producing sleep, without adding any new action. I never could discover why the impression of a medicine might not directly, and intirely arrest a particular morbid action, and produce a new one differing in quality, and (if any one chooses) less in quantity. As a matter of fact (as is well known) a very small quantity of the Venom of the Uropsophus (*Caudisona*) *durissus*, applied by inoculation, is capable of suddenly and rapidly diminishing all the actions of the whole system, so as to produce death (according to published statements) in two minutes. If any one inclines to discredit such accounts, cases that have occurred among us, can be adduced, in which death took place in less than twenty minutes. This will be sufficient for our purpose. In view of such facts, I cannot well understand how direct Sedation (I do not here say exhaustion) can well be doubted or denied. What is the operation of Cyanid of Hydrogen, what of the Alcaloid Curarine, what of the substance called Antiarine, and what of the Alcaloid Nicotine? I should think that the operation and effects of such articles must settle this question forever.

I am not aware that a Tonic power has ever been confounded with a Narcotic power, as I suppose, because these two powers are not often, if ever, found in conjunction, in nature. If they were, it seems as probable to me that they would be confounded, as any of the powers that I have hitherto mentioned. When I say they are not often, if ever, found conjoined in nature, I am not unmindful that a contrary statement is some times made. I am not unmindful of what is commonly said of the yellow powder of the strobiles of *Humulus Lupulus*; but I can only say that I have repeatedly made experiments for the purpose of determining whether it is Narcotic or not, and I never could find any body capable of swallowing enough to prove Narcotic in the slightest degree. This article will, of course, be considered elsewhere. I have heard both Narcotic and Tonic powers ascribed to *Marrubium vulgare*, *Ballota nigra*, *Lycopus Europæus*, *Lycopus sinuatus*, etc. The fact that both these powers are separately and specifically ascribed to these articles, would seem to show conclusively that these powers were discriminated; and yet neither of these four articles is in reality the least Narcotic whatever, though it is

well known that they are truly Tonic. I have myself been in the habit of prescribing the whole of them, except *Ballota nigra*. I am not unmindful of what is alleged of *Simaruba versicolor* (*St. Hilaire*.) I am apprised that Martius says of this plant, "cortex principio Subnarcotico," etc. "pollet," et "ab incolis inter venena numerantur." I shall say more of this article, in a more appropriate place; and I can only state here that I have had what seemed to be good testimony to the intire destitution of any Narcotic power in this bark. It is well known that the bark and perhaps the wood, of *Picræna excelsa* (*Lindley*) a very nearly allied article, has had a similar reputation; and yet, though I have seen it employed very often, and that too with great freedom, I never witnessed the least Narcotic operation. Let it not be thought that I am not fully apprised that Narcotic and Tonic powers in conjunction are commonly ascribed to *Ignatia amara*, *Strychnos Nuxvomica*, and some other very similar or analogous species. That these articles are Tonic I think that I know very well; but I do not consider them as at all Narcotic, the prevalent opinion to the contrary notwithstanding. But I shall treat of this else where. There are however some articles, which are the mere products of chimistery so far as their proximate composition is concerned; that are most decidedly both Narcotic and Tonic in conjunction, as for example, the Cyanid of Cinchoninum, the Cyanid of Quininum, the Dicyanoferrite of Cyanid of Cinchoninum, and the Dicyanoferrite of Cyanid of Quininum. These being factitious and made-up of a well known active Narcotic and a well known active Tonic, the two powers can not fail of being distinguished.

I have no knowledge of any natural compound of a Styptic with a Narcotic power, nor do I know of any factitious chimical compound that deserves to be mentioned as such.

An Adenagic power is some times associated with a Narcotic power; and so far as I have had opportunity to make observations, is not commonly distinguished from it. *Digitalis purpurea* and other species, and also *Conium maculatum* (among Narcotics well known to the medical profession) possess Adenagic power in addition to their Narcotic power, which (as far as I have been able to ascertain) is rarely, if ever, distinguished from their Narcotic power. In an argument on this subject, with a medical friend, I once referred him to the numerous cases, in which a di-

rect resolution of topical Phlogoses had been produced within a period between twelve and twenty-four hours, by a free use of one or the other of these agents. He insisted that any and every sufficiently active Narcotic would produce the same effect; said that he had often witnessed it from Papaver; and asked if I reckoned that article Adenagic. Now, it is not the fact that every sufficiently active Narcotic will produce such resolutions generally. There are however some cases of Phlogosis, that are so purely irritative, that they are capable of being overcome by Non-Adenagic Antirritants of sufficient activity, and in sufficient quantity. It is true that Papaver is not at all Adenagic, and yet it will produce a resolution of such cases as I have here described; and there are other Non-Adenagic Narcotics which will do the same. There is however no difficulty, at least generally, in distinguishing an Adenagic-Narcotic from a Non-Adenagic one. But this subject, as I trust, will be made sufficiently intelligible, when I come to the consideration of the Adenagics as a class, which it will be seen at once is the proper place for it. Digitalis is Narcotic and Adenagic, and nothing else. Conium maculatum is probably the same, though possibly it may be Erethistic or perhaps Euphrenic. This again I shall consider in a more appropriate place. Nicotiana Tabacum is also Narcotic and Adenagic; but then it possesses several other powers in addition. Its Euphrenic power like its Adenagic power, is commonly confounded with its Narcotic power, with the exception merely that it is admitted to be Diuretic, though it is so only as a part of its adenagic operation. Its Emetic and Cathartic powers I believe are always recognized as distinct from its Narcotic power. I consider nothing in the materia medica as more certain, than that Narcotic and Adenagic powers are perfectly different and distinct, since there are a multitude of Narcotics which possess no degree of Adenagic power; and likewise a multitude of Adenagics which are equally destitute of the very least amount of Narcotic power.

I know of no Narcotics of vegetable-organic origin, that are Diuretic or Uragogue, except as a part of a true Adenagic operation. Digitalis, which is commonly reckoned as a mere Diuretic-Narcotic, is certainly Adenagic, if the power of producing a direct resolution of certain Phlogoses is any evidence of an Adenagic power. All the other Diuretic-Narcotics within my knowledge are in the same predicament.

The most certain and effectual Diaphoretic or Hidrotagogue in the materia medica is likewise the most important Narcotic. Here I intend Papaver. Camphor is perhaps second only to Papaver; and probably Wine and Alcohol come next. The degree both of their Narcotic and Diaphoretic powers is in the order in which I have mentioned them.

I know of no Narcotics that are Blennagogue or Emmenagogue, except as a part of an Adenagic operation. Indeed, as I inculcate else where, probably no true Blennagogues or Emmenagogues are at present known; though of late, one or two of the latter (as is supposed) have been discovered. This however I do not think has been fully proved, though perhaps it may yet be.

I do not know that any body has ever supposed that an Ecboolic power is identical with a Narcotic power, though at one time I almost imagined that such would prove to be the fact, provided the Erethistics should still be reckoned as Narcotics, which however I do not think they can possibly be, with any shadow of propriety. I was first led to this suspicion (as I think it may be so called) by the following facts. Some of the Ecboolics are such, by virtue merely of a Narcotic power, the several parts of which are of the peculiar character, that I have already described. At least so it seems to me. What the progress of discovery may develope in regard to this subject, of course I can not tell. I have found the same true of the Erethistics. I think it constitutes the strongest argument within my knowledge for reckoning the Erethistics as Narcotics, that, like the Narcotics, they should be capable of producing Spasms or Convulsions, and that those which produce Spasms or Convulsions of the common sort; and as a primary part of their operation, and in the muscles of involuntary motion, in preference to the muscles of voluntary motion, and in those dependent upon the nerve of chymical action, nutrition and reproduction, in preference to those dependent upon the nerve of expression, should be Ecboolics. At present, several articles are reckoned by some physicians as Ecboolics (though I think they have not yet been proved to be such) which are certainly not Narcotics; and I know of no facts which contribute to prove them Erethistics.

I am not apprised that Errhine and Esstomatic powers have ever been confounded with Narcotic powers, though the most

common Errhine and Esstomatic in common use, is an active Narcotic, viz. *Nicotiana Tabacum*. The power of irritating the mucous membrane of the nostrils and mouth, and also the excretories which pour their secretions into these cavities, thereby producing greatly increased secretions, is certainly different and distinct from the Narcotic power of *Nicotiana Tabacum*, and so far as I understand the subject, has always been considered so. To what power then, is the Errhine and Esstomatic operation of *Nicotiana Tabacum* really due? As this agent is certainly Adenagic, and as Adenagics unquestionably operate locally, in some cases, and by local application also, as in the discussion of topical Phlogoses, it may be thought by some that this is the power, by which it occasions increased secretions into the nostrils and mouth; and perhaps this power does actually produce a share of these effects; and yet, I am inclined to think that they are mainly due to a peculiar and specific acrimony, upon which a peculiar and specific Oresthetic power depends. It is quite possible however, that its Errhine and Esstomatic effects result from both of these two powers.

Emetic and Cathartic powers are very often associated with a Narcotic power, and have never, to my knowledge, been confounded with the latter. No more prominent and familiar example of this association, than is found in *Nicotiana Tabacum*, can be mentioned. This article, I believe, has always been admitted to possess Narcotic, Emetic and Cathartic powers, as perfectly distinct from each other; and some times, it has been admitted to be Diuretic. It is Diuretic however, only as a part of its Adenagic operation, this power having been intirely overlooked. Its Euphrenic power, for which exclusively, it is in such general popular use, and also its Oresthetic power, have always been confounded with its Narcotic power.

In regard to the grouping of the Narcotics, it must be particularly observed that on my plan, it depends exclusively upon the different and distinct powers which are possessed by each individual article, and not at all upon any similarity in the quality of the Narcotic power. For example, Camphor is put into the same group with Papaver, because like Papaver, it is considered to be Erethistic, Euphrenic, Antisbestic and Diaphoretic. The precise quality of the Narcotic power of Camphor is certainly quite dif-

ferent from the precise quality of the Narcotic power of *Papaver*, and this is equally true of all the other powers.

NARCOTICA VEGETABILIA.

TURMA PRIMA.

PURA.

The simple or pure Narcotics, as a group, consist of all those articles that produce no other effects but those of a Narcotic merely. A number of articles in the following catalogue are put down from authority merely. Now I very well know that authority is very often not to be relied upon. For example, in all the late works upon the *materia medica* *Rhus radicans* and *Rhus Toxicodendron* are considered as Narcotics. Now I happen to be perfectly acquainted with the powers, operations and effects of these two articles, and I very well know that they are no more Narcotic than *Cantharis vesicatoria*, an article with which they have the most striking analogy.

It is commonly reckoned that every article capable of stupefying fish must of necessity be Narcotic. Upon this point I have great doubts; indeed I am skeptical in regard to it. But when any other apparently unequivocal circumstance concurs with this, to indicate that an article is Narcotic, I have commonly put it down in my list; though I am by no means sure that I have been correct, in all cases. Lindley says that "nothing more plainly indicates the venomous"* (Narcotic) "nature of Fabaceous plants

* Professor John Lindley, (not a physician, though the author of a work on the *materia medica*) very often employs the term venomous in the room of Narcotic. The English word venom, from which comes venomous, is only a modification of the Latin word *venenum*, from which comes *venenose*, so that radically they have the same signification precisely; and yet among physicians their application is always different. A certain secreted fluid of *Uropsophus* (*Caudisoma*) *durissus* (Rattle Snake) and other poisonous Serpents, is correctly said to be venomous, while the bark of *Strychnos toxifera* is correctly said to be *venenose*. But though *venenose* is an appropriate term in application to a Narcotic, it is equally appropriate in application to any equally poisonous plant, which is not Narcotic at all. But many physicians and many scientific men not physicians, do not seem to consider any thing as poisonous, except Narcotics. It is however sufficient for our present purpose to know that here, and in various other places, by the term venomous Lindley clearly intends Narcotic, and that a considerable number of Fabaceous plants are actually such.

than their being used as fish poisons." (*Lindl. Veget. Kingd. Lond.* 1846, *Pg.* 549.) At the present time (in imitation of the French) the powers of articles are often mentioned in such strange and obscure terms—terms wholly founded upon speculations and hypotheses, that it is difficult, and some times impossible to ascertain whether an author considers an article to be Narcotic or not. For example, when an author tells us that an article acts upon the cerebri-spinal system, I do not always know whether he means to pronounce it Narcotic or not. So far as I am able to find-out the import of this compound phrase, it implies the brain and all the rest of the nervous system, except the great sympathetic nerve. Now there is a great multitude of articles that act upon the cerebri-spinal system (in this acceptation of the phrase) which are not Narcotics; though authors seem to mean Narcotics, by it, and very often actually do so. In consequence of the use of a great multitude of simple and compound terms, and phrases, founded upon speculations and hypothesis merely, it is utterly impossible to distinguish those articles which I call Erethistics, from the true and proper Narcotics, by such accounts of their operations and effects, as are to be found in late works on the *materia medica*. Such being the fact, it is possible—perhaps probable—that among the articles put down from authority merely, I may have some that are Erethistics instead of Narcotics—some few that are neither Erethistics nor Narcotics. For example, *Tanghinia venenifera* has been known and treated-of, for a comparatively long time, and is certainly an important article, and yet it is mentioned in such a manner and in such language that I am unable to decide absolutely whether it is an Erethistic or a Narcotic, or even whether it is either. The facts that it destroys life in an exceedingly small quantity, and with very great speed, that several of the most nearly allied articles have long been reckoned Narcotics (but whether correctly or not I am unable to determine) is the strongest ground that I know for placing it among the Narcotics. I know of no other power that is capable of producing as speedy death, and by so small a quantity of the agent.

Nothing is more probable than that I have ranked some Narcotics as simple and pure ones, which really possess other different and distinct powers; but I can not procede upon what I do not know; and I have made my arrangement according to my

knowledge. When I mention a Narcotic as a pure one, all I intend by this is that I have no positive knowledge and no satisfactory testimony that it possesses any additional powers. For aught that I know, every Narcotic, that I have here mentioned as pure, may yet be discovered to possess additional powers. Some articles that I have reckoned in this group (I have long had strong suspicions) may possess other powers; but hitherto I have been unable to obtain satisfactory evidence of it. Whenever I find this evidence, I shall place such articles where any newly discovered powers may fairly carry them. I am not at all sure that I have succeeded even in a tolerable degree, in making any thing like a true natural arrangement of the pure Narcotics among themselves. This is not to be expected, in the present imperfect state of our knowledge in regard to most of them. Even if we possessed far more information, than at present, such a task would be far from easy. All that I can say therefore, is, that I have done the best that I was able to do.*

STRYCHNOS TOXIFERA (*Schomburgk.*)

?STRYCHNOS ? COGENS (*Bentham.*)

ROUHAMON GUJANENSIS (*Aublet.*)

ROUHAMON ? CURARE (*De Candolle.*)

There is good reason for believing that all of these four articles, unless it is the second, contain the Alcaloid Curarina or Curarine, and depend upon it for their activity. The medicinal power of the second may be said to be disputed and unsettled. If it proves to be active, I doubt not it will be found to contain this same Alcaloid. As Curarina or Curarine acts more especially upon the nerves of expression, destroying life by suspending their function, and as these articles are not known to contain any other active principle, this must of course be their mode of operation. We are wholly ignorant as to the sort of Spasms or Convulsions which they produce. These are so rare and transient, that some have denied their occurrence at all.

GELSEMINUM NITIDUM.†

* It is my purpose not to mention any more the natural orders, tribes, etc. of the several articles, which make-up my medicinal classes.

† The generic name Gelseminum is a mere Latinization of the Italian Gelsemino,

SPIGELIA ANTHELMIA (*Linn.*)
 SPIGELIA GLABRATA (*Martius.*)
 SPIGELIA MARILANDICA (*Linn.*)
 SPIGELIA FRUTICULOSA (*La March.*)

The subordinate part of the nervous system, upon which the last five articles more especially act, and the manner in which they destroy life, has never been accurately observed, though (as there is good reason to believe) not for want of opportunity. Neither do we know the sort of Spasms or Convulsions which they produce. It is believed that these are a rare and transient effect of their operation.

AMIANTHUM MUSCITOXIUM (*A. Gray.*)

I do not know the sort of Spasms or Convulsions which this article produces, nor has it been observed what subordinate part of the nervous system it acts more especially upon, or whose functions it suspends, when it destroys life. This knowledge is still a great desideratum, since it is highly important for its most judicious application in therapeutics. I have been in the habit of considering this article as more nearly allied, medicinally to Gelsemium than Spigelia is, though it is not so botanically. I believe it to be considerably more active, however, than Spigelia, though this latter article is considerably more active than is commonly supposed. That which is found in the shops is often very nearly worthless from being collected at an improper time, from being badly dried and pressed, and from the employment of the least active part, and some times from bad pharmaceutic preparations.

As the following articles are produced by the catalytic decomposition of a vegetable-organic proximate principle, and a recombination of its elements into new forms, I shall arrange them among articles of vegetable-organic origin. I do not think, however, that the circumstances under which this proximate principle

and should not therefore be written Gelsemium as Jussieu, Michaux, and some others write it, but rather Gelsemium as Catesby wrote it before all the others. As a trivial name, *nitidum* should be preferred to *sempervirens*, because the leaves are eminently nitid, but are not sempervirent.

is decomposed in the right way to produce the new active medicinal principles, can ever occur spontaneously or accidentally, so that these articles are as purely the creatures of science and art, as any of the chymical-inorganic compound principles hereafter to be mentioned in this class; though a vegetable-organic compound principle contained in the several plants now to be mentioned, is the material upon which we operate.

{ HYDROGENII BENZHYLIDUM.
 { *Acidum Benzhylohydricum.*

I do not certainly know what sort of Spasms or Convulsions the Benzhylid of Hydrogen produces; but I believe, the common sort. It is uniformly said to destroy life in the same manner as Protocyanid of Hydrogen, and if it does, it may be considered certain that it acts more especially upon the nerves of expression.

{ HYDROGENII PROTOCYANIDUM.
 { *Acidum Cyanohydricum.*

I think it may be considered as certain that the Protocyanid of Hydrogen produces common Spasms or Convulsions, and such only; but they are of rare occurrence, sudden in their access, and very transient and fugitive in their character. It is likewise absolutely certain that it destroys life by suspending the functions of the nerves of expression, that this suspension is prostration and not exhaustion, and that life may always be saved under a poisonous dose of it, by factitious respiration begun soon enough and continued long enough i. e. till its effects have intirely passed off.

CYANOGENII COMPOSITA VARIA.

CYANOGENIUM CONCRETUM.

So far as relates to the sort of Spasms or Convulsions produced, the subordinate part of the nervous system more especially affected, and the manner of destroying life it is obvious that concrete Cyanogen must operate in the same manner as its compounds with other and inert elements.

On account of two erroneously supposed educts (in reality products) which are highly active, two of the following articles (viz. *Cerasus Lauri*-*Cerasus*, and *Amygdalus communis*) have long held a place in the list of the Narcotics, in all works on the *materia medica*. But if these two are entitled to such a station, all the rest which I have specified are equally entitled to it, since they are perfectly analogous, indeed identical as respects the proximate principles of similar parts; as respects chymical habitudes and relations; as respects external sensible properties; and as respects occult medicinal powers, operations and effects. The articles in question are the next twenty-one, all belonging either to the *Amygdalacæ* or to the *Pyracæ*. It is by no means improbable that all the species of the genera *Cerasus*, *Prunus*, *Amygdalus*, *Persica*, *Sorbus*, and *Malus* contain both of the Alcaloids *Amygdaline* and *Emulsine*, and consequently are capable, by the proper processes, of producing Benzhylid of Hydrogen and Cyanid of Hydrogen. I thought it best however to mention only such species as have obtained a place in standard works on the *materia medica*.

CERASUS LAURI-CERASUS (*Loiseleur.*)

CERASUS CAROLINIANA (*Michaux.*)

CERASUS OCCIDENTALIS (*Loiseleur.*)

CERASUS SPHÆROCARPA (*Loiseleur.*)

CERASUS ILLICIFOLIUS (*Nuttall.*)

CERASUS PADUS (*De Candolle.*)

CERASUS SEROTINA (*Seringe, De Cand.*)

CERASUS VIRGINIANA (*Seringe, De Cand.*)

CERASUS CAPOLLIN (*Seringe, De Cand.*)

CERASUS UNDULATA (*Seringe.*)

CERASUS AVIUM (*Moench.*)

CERASUS BRASILIENSIS (*Martius.*)

CERASUS CAPRICIDA.

PRUNUS BRIGANTIACA.

PRUNUS COCCOMILIA (*Tenore.*)

PRUNUS DOMESTICA (*Linn.*)PRUNUS SPINOSA (*Linn.*)AMYGDALUS COMMUNIS (*Linn.*)PERSICA VULGARIS (*Miller.*)PERSICA LÆVIS (*De Cand.*)SORBUS AUCUPARIA (*Linn.*)SORBUS AMERICANA (*Pursh.*)

{ MALUS COMMUNIS (*Darlington.*)
 { *Malus sylvestris* (*Bauhin, Miller.*)

It must be borne in mind that, so far as any Narcotic power is concerned, these articles in their crude state, and in all ordinary pharmaceutic preparations, are inert; and that after they have been operated chimically upon, for the production of certain Narcotic compounds, they are inert so far as respects any other power. Thus operated upon, they may be mentioned here as pure Narcotics; while in their crude forms, and in their ordinary pharmaceutic preparations, they may be mentioned elsewhere as pure Tonics. Before the chemistry of these articles was well understood, I had carefully investigated several of the Amygdalaceæ and of the Pyraceæ, in their ordinary pharmaceutic preparations of Powder, Infusion, Decoction and Tincture, and had utterly failed of producing any grade or degree of a Narcotic effect. At present however, I believe that it is perfectly well known that Benzhylid of Hydrogen and Cyanid of Hydrogen, the formerly supposed Narcotic active principles of the Amygdalaceæ and the Pyraceæ are found no where as natural productions. They are neither of vegetable-organic origin, nor of animal-organic origin, nor of mineral-inorganic origin, but always mere chimical-factitious products. Benzhylid of Hydrogen and Cyanid of Hydrogen no more exist in any of these plants, either in a living or a dead state, than Wine, Alcohol or Common Æther exist in Grapes. But as these species, and doubtless others of the Amygdalaceæ and Pyraceæ furnish the two principles, which are necessary for the production of Benzhylid of Hydrogen and Cyanid

of Hydrogen, it is proper to include them in the *materia medica*. The number which I specify is exactly that which I find specified in books.

From the *Amygdalaceæ* and *Pyraceæ* onward till I specify to the contrary, the sort of Spasms or Convulsions produced by each article and group of articles is unrecorded, and so is the subordinate part of the nervous system upon which each article and group of articles act more especially, and whose functions they suspend when they destroy life.

ATROPA LETHALIS (*Salisbury.*)
 DATURA FASTUOSA (*Linn.*)
 DATURA FEROX (*Linn.*)
 DATURA METEL (*Linn.*)
 DATURA STRAMONIUM (*Linn.*)
 DATURA TATULA (*Linn.*)
 BRUGMANSIA CANDIDA (*Persoon.*)
 BRUGMANSIA BICOLOR (*Persoon.*)
 MANDRAGORA VERNALIS (*Bertol.*)
 MANDRAGORA AUTUMNALIS (*Bertol.*)

This group of simple and pure Narcotics uniformly produces dilatation of the pupils of the eyes—so uniformly that a moderate degree of this effect is considered as a test that the system is under a suitable degree of their influence to produce their proper medicinal effects.

HYOSCYAMUS ALBUS (*Linn.*)
 HYOSCYAMUS AUREUS (*Linn.*)
 HYOSCYAMUS NIGER (*Linn.*)
 HYOSCYAMUS PHYSALOÏDES (*Linn.*)
 { SCOPOLINA ATROPOÏDES (*Schultes.*)
 Scopolia Carniolica
 { *Hyoscyamus Scopolia* (*Linn.*)

This group of simple and pure Narcotics is supposed to operate in a manner peculiarly like *Papaver*, only in a much more eligible way. They are supposed by many to produce all the desirable effects of *Papaver*, without any of the undesirable ones.

As appears to me, however, a greater mistake could not well be made. In all cases, I think that the operation of Papaver is far more pleasant and agreeable than that of any individual of this group. These articles are simple and pure Narcotics, while Papaver, as I have already had occasion to say, possesses at least five different and distinct powers. In addition to this, there appears to me to be as little similarity in quality between the Narcotic power of this group of articles and that of Papaver, as between the Narcotic power of any two articles of the whole class.

PHYSALIS SOMNIFERA (*Linn.*)

PHYSALIS ANGULATA (*Linn.*)

PHYSALIS PUBESCENS (*Linn.*)

PHYSALIS VISCOSA (*Linn.*)

This group of articles is commonly affirmed to be both Narcotic and Diuretic; but this statement, without any explanation, must certainly lead to error. The Narcotic is said to be the sole power of the leaves, while the fruit, at least when ripe, is exclusively Diuretic. Admitting this statement to be true, the leaves must be ranked with the simple and pure Narcotics, while the ripe fruit must be ranked with the simple and pure Diuretics. There is good authority for the ascription of these powers to these species. A resolvent power is also ascribed to them, but this does not rest on as good authority, and is extremely improbable. I do not think that there is any resolvent, except as a part of an Adenagic power, and I am confident that they are not Adenagic.

There is no more probability that the substance to be mentioned next is really and truly of living vegetable-organic origin, an educt from a plant instead of a pure factitious product of chemistry, than there was that Cyanid of Hydrogen or Cyanohydric Acid, and Benzhylid of Hydrogen or Benzhylohydric Acid were such, although we do not know its real nature, character and origin. In our present state of ignorance about it, I think it best to mention it in this immediate connexion.

AQUA RASURÆ TUBERUM SOLANI TUBEROSI (*Linn.*)

These tubers, in their crude state, are certainly incapable of

any such Narcotic effects as the water, in which their raspings have been macerated, will assuredly produce. It appears to me that this shows conclusively that the Narcotic principle, upon which the activity of this water depends, is generated in the process of maceration, being a product of it, and not an educt from the tubers. In order to be convenient for use in medicine, this water requires to be reduced to an Extract.

*ACOCANTHERA VENENATA,**
CESTRUM BRACTEATUM (Link.)
CESTRUM CORYMBOSUM (Schlecht.)
CESTRUM EUANTHES (Schlecht.)
CESTRUM LÆVIGATUM (Schlecht.)
CESTRUM PARQUI (L'Heritier.)
CESTRUM MACROPHYLLUM.
CESTRUM NOCTURNUM.

AQUA CANNABIS SATIVÆ (Linn.)

It must be particularly observed that this preparation of Cannabis sativa is intirely different as respects its power, operation and effects, from the power, operation and effects of the Resin or Alcoholic Extract of Cannabis Indica. In all probability, the latter is not Narcotic at all, but only Euphrenic; or if it is Narcotic it is so slightly so as to be nearly lost in its Euphrenic power. But the preparation here intended is a pure Narcotic, without any Euphrenic power in conjunction. It is only the water in which the Cannabis sativa has been long macerated, and not the Cannabis itself, that is truly Narcotic. The crude plant can not be made to produce any such effect, though an Alcoholic Extract of certain parts of it is capable of producing effects similar to those of the Alcoholic Extract of Cannabis Indica, only in a much less degree. I am therefore strongly inclined to believe that the principle, which gives activity to the water, is not an educt from the plant, but only a product of the process of its maceration in water. This water should be reduced to an Extract to render it convenient for medicinal use.

*The trivial name of this article should be *venenosa*, which means *poisonous*, and not *venenata*, which means *poisoned*.

AQUA. { *ECHALTI PISCIDII* (*Wright.*
 { *Wrightiæ Piscidiæ* (*G. Don.*)
 { *Nerii Piscidii* (*Roxburgh.*)

This article is analogous to that which immediately precedes it—indeed it is very much like it in all respects. If I am correctly informed, it is only water, in which this plant has been macerated that is Narcotic. As I suppose, the crude plant exerts no Narcotic power, and produces no Narcotic operation or effects. Therefore it does not appear to me at all probable that this article, in its natural state, contains any Narcotic principle. As I believe, that which is contained in the water in which it is macerated, is probably a product of the process, and not an educt from the plant. But all this may not be as well ascertained as it is supposed to be. This water, like that of the raspings of the tubers of *Solanum tuberosum*, and that of *Cannabis sativa* should be reduced to an Extract, in order to render it convenient for use in medicine.

{ *BLABEROPUS VENENATUS* (*De Cand.*)
 { *Alstonia venenata* (*Brown.*)
 { *Echites venenata* (*Roxburgh.*)

This is different and distinct from *Echites venenosa* (*Stadelmeyer, Martius and De Candolle.*)

ECHITES VENENOSA (*Stadelmeyer.*)

According to Mungo Park, the Mandigoes of the Niger poison their arrows with a species of *Echites*, but the trivial name of the species is not mentioned.

{ *NERIANDRA SUBERECTA* (*De Cand.*)
 { *Echites suberecta* (*Andrews.*)

{ *TANGHINIA VENENIFERA* (*Poiret.*)
 { *Cerbera Taughin* (*Hooker.*)

I believe that this article is a pure and very intense Narcotic,

at least it is so, to the best of my knowledge. At all events, it is one of the most active articles in the *materia medica*.

CAMERARIA LATIFOLIA (Jacquin.)

This article is said to be Narcotic, so much so as to be employed for the purpose of envenoming arrows. This seems to be the most authentic account of this agent. One author says of it that its juice is acrid, and an other that it contains an abundance of Caoutchouc. It is therefore possible that it is Oresthetic as well as Narcotic; but this is not probable. Although much is said of this article by different authors, yet it is all so vague that nothing definite can be derived from it, except that it is Narcotic, and therefore as it is nearly allied botanically to *Tanghinia venenifera*, I place it in immediate connexion with that agent.

{ *THEVETIA AHOVAÏ (De Cand.)*
Ahovaï Thevetia (J. Bauhin.)
Cerbera Ahovaï (Linn.)

{ *THEVETIA NERIIFOLIA (Jussieu.)*
Ahovaï Neriifolia (Plumier.)
Cerbera Thevetia (Linn.)
Cerbera Peruviana (Persoon.)

PAULLINIA AUSTRALIS.

PAULLINIA CURURU (Linn.)

? *PAULLINIA CUPRANA (H. B. & K.)*

PAULLINIA GRANDIFLORA (St. Hil.)

PAULLINIA PINNATA (Linn.)

PAULLINIA (Tingi.)

SERJANIA } *LETHALIS (St. Hil.)*
SERIANA }

SERJANIA TRITERNATA (Willdenow.)

{ *MAGONIA PUBESCENS (St. Hilaire.)*

{ *Phæocarpus campestris (Martius.)*

{ *MAGONIA GLABRATA (St. Hilaire.)*

{ *Phæocarpus glabratus.*

TEPHROSIA EMARGINATA (H. B. & K.)

TEPHROSIA PISCATORIA (*Persoon.*)TEPHROSIA TOXICARIA (*Persoon.*)LONCHOCARPUS NICOU (*De Cand.*)SABINEA FLORIDA (*De Cand.*)

LABURNUM ALPINUM.

LABURNUM VULGARE.

LABURNUM? } (*Welden.*)

CYTISUS ? }

PISCIDIA ERYTHRINA (*Willdenow.*)

Piscidia Erythrina is reported to be Diaphoretic as well as Narcotic; but the testimony that I have met with is not sufficient to prove this. Not infrequently certain Narcotics prove indirectly Diaphoretic by means of their Antirritant operation, and I suspect that this is the fact in this case.

LATHYRUS APHACA (*Linn.*)LATHYRUS CICERA (*Linn.*)PHASEOLUS MULTIFLORUS (*Willdenow.*)PHASEOLUS RADIATUS (*Linn.*)CORONILLA VARIA (*Linn.*)CASSIA VENENIFERA (*Meyen.*)DETARIUM SENEGALENSE (*Gmelin.*)MIMOSA (*Spongia.*)

ALGAROBIA FERRUGINEA.

ALGAROBIA IULIFLORA.

ALGAROBIA LEUCOPHEA.

SASSA (*Aborigenum Vicinitatis Promontorii
Palmarum.*)

There is a rough, thick, dark colored bark, called Sassa, 'used in the form of Infusion or Decoction, as an ordeal, by the aborigines of the country in the neighborhood of Cape Palmas,

Western Africa, which is said to be a powerful Narcotic, and which therefore is doubtless a highly valuable medicine. No naturalist seems to have examined and determined the genus or even order of the tree which produces it, and consequently we are profoundly ignorant both of its name and its affinities. Miss Hening, in her history of the African Missions of the Anglican Church of the U. S. A. in that region, says that this bark is the produce of a species of Laurel, doubtless meaning *Laurus*, since there is no such genus as Laurel. But, as appears to me, there is no probability that this is true, since Lindley says, "scarcely any species are known to exist on the continent of Africa." Unless Miss Hening is a scientific botanist, she is much more likely than not to be in error in regard to this matter. There is a tree of the order Fabaceæ, of the sub-order Mimoseæ, and of the tribe Aca-ciæ, whose trivial name is Sassa. It is

{ *ZYGIA SASSA*
 { *Inga Sassa* (*Willdenow*)
 { *Sassa* (*James Bruce*)

which is indigenous in Abyssinia, and which, I believe, furnishes a large amount of a somewhat peculiar and very white Gum, and therefore, would seem not to be likely to be an active Narcotic, though somewhere about twenty Fabaceous plants are reckoned as Narcotics.

Among the Apiaceæ, there is a number of simple and pure Narcotics, some possessing this power in a very intense degree, some only in a moderate degree, and others possessing it in every possible grade between the two extremes. Among the simple and pure Narcotic Apiaceæ, I have put down a number of articles, to which widely different powers are universally ascribed, and which are universally employed for widely different effects, and some of them indeed, only in dietetics. I have, however, had good testimony to the effect that some times, and in some states, they operate as Narcotics, though at other times, and in other states, they operate in a widely different manner. For example, the perfectly ripe and dried seeds of *Heracleum lanatum* are ordinarily used by *femmes sages* (and for aught I know, by *sages femmes*) with as much freedom as they use the seeds of Cummin, Caraway, Dill,

Fennel or Anise, and with only the effects of those articles, commonly called Carminatives; though I have repeatedly seen alarming Narcotic effects from the full grown, but unripe seeds. Just so it is with a considerable number of the Apiaceæ. Again, I think there is good reason to believe that the recent and undried root of a wild plant growing in a wet place, often operates in a manner widely different from the dried root of a cultivated plant growing in a dry place. This will explain my location of some of the species of Archangelica and Angelica, articles which are usually mentioned as Carminatives (as the professional term is, though it is a term pertaining to conjuration rather than medicine) and sometimes as used in dietetics. But I have placed a note of interrogation before all of those articles not commonly reckoned as Narcotics, but being so only according to circumstances. I might easily have enlarged the list of these articles, but what I have mentioned will serve for examples.

Certain pharmaceutic preparations of *Conium maculatum* (perhaps the whole of them, though I think not,) are decidedly Adenagic, in addition to their Narcotic power. So certain do I consider this, that I shall rank *Conium* as an Adenagic-Narcotic. There are several others of the Narcotic Apiaceæ, that when taken internally are alleged to cure cutaneous diseases, and to prove Uragogue or Diuretic. I should think there can be little doubt that they produce these last two effects by virtue of an Adenagic power; but, as I have not had opportunity to ascertain this positively and decidedly, except in the case of *Conium*, I put them down as simple and pure Narcotics, with a query whether they are not Adenagics also, leaving it to future investigations and observations to determine this point.

CICUTA VIROSA (Linn.)

CICUTA MACULATA (Linn.)

? *CICUTA BULBIFERA* (Linn.)

• *SIUM LATIFOLIUM* (Linn.)

SIUM ANGUSTIFOLIUM (Linn.)

Qu? Adenagic?

SIUM LINEARE (Michaux.)

HELOCIADIUM NODIFLORUM (Kock.)

Qu? Adenagic?

APIUM GRAVEOLENS (Linn.)

It may surprise some to see *Apium graveolens* in this list; but there is good authority for the Narcotic-poisonous power of the recent root of the wild plant. Even the full grown but unripe seeds are also said to be Subnarcotic. The fact that the cultivated and blanched stem is esculent and harmless, is no argument against the preceding statement.

ÆTHUSA CYNAPIUM (Linn.)

CENANTHE OROGATA (Linn.)

CENANTHE FISTULOSA (Linn.)

PHELLANDRIUM AQUATICUM (Linn.)

Qu. Adenagio?

LYCHTENSTEINIA PYRETHRIFOLIA (Chamiss. and Schlect.)

HERACLEUM LANATUM (Michaux.)

HERACLEUM SPHONDYLIIUM (Linn.)

It is no argument against the Narcotic power of the full-grown but unripe seeds of *Heracleum Sphondylium*, that the peeled or decorticated stems are eaten.

? *ARCHANGELICA OFFICINALIS (Hoffman.)*

? *ARCHANGELICA ATROPURPUREA (Hoffman.)*

? *ARCHANGELICA HIRSUTA (Torrey & Gray.)*

? *ANGELICA NEMOROSA (Tenore.)*

? *ANGELICA SYLVESTRIS (Linn.)*

In regard to the first three articles of this sub-group, I have had considerable testimony that the recent roots of the wild plants have proved Narcotic. The full-grown but unripe seeds, when eaten by children, are said to have operated in the same manner. The ordinary use of the dried roots of the cultivated plants, does not at all contribute to disprove this.

CORIANDRUM SATIVUM (Linn.)

The full-grown but unripe seeds, when eaten by children, are said to have proved at least Subnarcotic. I venture to say that no child ever eat very many of them at once. They certainly have

a virose, as well as a Cimex-like odor. Their inertness, when perfectly ripe and dry, is no argument against their activity in the state above specified.

ANTHRISCUS SYLVESTRIS (*Hoffman.*)

ANTHRISCUS VULGARIS (*Hoffman.*)

{ LEPIDIUM PISCIDIUM (*Forster.*)

{ *Lepidium bidentatum* (*Montin.*)

LOLIUM TEMULENTUM (*Linn.*)

FESTUCA QUADRIDENTATA (*Kunth.*)

MOLINIA VARIA (*Schrank.*)

BROMUS SECALINUS (*Linn.*)

BROMUS MOLLIS (*Linn.*)

PASPALUM SCROBICULATUM (*Linn.*)

The activity of *Bromus Secalinus* and *Bromus mollis*, has been affirmed and denied on almost equally good authority. Most of the farmers that I have known, have believed fully in the activity of the former. The latter is much less known, but perhaps has better authorities against it. But those who deny the activity of these two articles, admit that they are exceedingly unwholesome. As to the rest of this small group, I suppose there is no room for doubt.

I think there is good reason to believe that the nexus Fungales, or the order Fungaceæ (whichever it may be,) contains some, perhaps very many, exceedingly valuable articles of medicine. But the misfortune is that this department of botany is a difficult one, at least it is so esteemed, whether correctly or not, I can not decide, and very few study it, and fewer still understand it. This discourages investigation in regard to the materia medica of this group of plants, and prevents a record of accidental observations, and thus occasions the loss of a multitude of important facts. I have very often known the most interesting information in regard to the powers, operations and effects of numerous Fungi, intirely neglected and lost, because the person in possession of them could not determine the species, and often not even the genus of the article whose effects he may have witnessed. This is doubtless the

reason why so little is on record in regard to the medicinal powers of the Fungi, and this is the reason why I can not myself furnish a considerable amount of interesting matter in regard to the materia medica of this great group of agents. This group of Narcotics might doubtless be made very large; but accurate observations are so much needed in regard to it, that I can scarcely say anything about it with confidence in its certainty. All the cases of poisoning from Fungi that I have ever witnessed, have been pure Narcotic poisoning, but not being a Mycetologist myself, and having none at hand to whom I could refer, I have never been able to ascertain the active articles; and this I suspect is the fact with nearly all American physicians; and perhaps I may say, with most European ones. I could relate many a tale if I could only make the hero known to the public. In short, I have employed several Fungi in my practice, and with much satisfaction, and so have a number of my friends, but (with one or two exceptions,) I am utterly unable to tell what they were. It is therefore out of my power to give a list of any considerable number of Fungi. I must therefore be content to name a few, by way of example, that are commonly mentioned by authors, though I am wholly unacquainted with them, and am unable to name those with which I am acquainted. I call the articles which I do name by such appellations as I find them called by, in books, without being able to decide whether I have referred them correctly to the most modern and best established genera. I should feel greatly mortified at all this ignorance, if I had not so much good company in it. Had it not been for an irremediable deficiency of books upon this subject, I know many a man who would have endeavored to cultivate it, and no doubt would have been successful. If Torrey's and Gray's excellent Flora of North America is ever finished (as I trust it will be,) I hope it will comprehend all our cryptogamous plants, and especially the Fungi; and then I hope that the time will soon come when all our examinations for medical diplomata will comprise a thorough investigation of the candidate's ability to ascertain any unknown plant, whether phenogamous or cryptogamous.

{ *AGARICUS NARCOTICUS* (Batsch.)
{ *Agaricus Lagopus* (Fries.)

- { *AMANITA LIVIDA* (*Persoon.*)
- { *Agaricus vaginatus* (*Bulliard.*)
- { *AMANITA VIRIDIS* (*Persoon.*)
- { *Agaricus bulbosus* (*Schaffer.*)
- { *RUSSULA FÆTENS.*
- { *Agaricus færens* (*Fries Persoon.*)
- { *Agaricus piperatus* (*Bulliard.*)
- { *GALARRHÆUS NECATOR.*
- { *Agaricus Necator* (*Bulliard.*)
- { *Agaricus Plumbeus* (*Schumacher.*)
- { *CREPIDOTUS OLEARIUS* (*Fries ?*)
- { *Agaricus Olearius* (*De Candolle.*)
- { *BOLETUS SCABER* (*Bulliard.*)
- { *Boletus Aurantiacus* (*Persoon.*)
- { *Boletus procerus* (*Bolton.*)
- { *LYSURUS MOKUSIN* (*Fries.*)
- { *Clathrus Mokusin* (*Sprengel.*)
- { *Phallus Mokusin* (*Linn.*)

SPERMŒDIA CLAVUS (*Fries.*)

vel

ERGOTÆTIA ABORTIFACIENS (*Smith & Queckett.*)

At the present time, I believe that *Spermœdia* and *Ergotætia* are considered as spurious genera, and *Claviceps* is adopted in their stead. Perhaps it is not a simple and pure Narcotic, and perhaps its Ecboic power is different and distinct. If such is the fact, the article is out of place here. This I shall discuss in a more appropriate place. In the mean time, no great harm can be done, by viewing it as a mere Narcotic, with a proper caveat, till I can treat of it more fully.

BARRINGTONIA SPECIOSA (*Forster.*)

PTERYGOTA ALATA.

BUNCHOSIA ARMENIACA (*De Candolle.*)

HIPPOPHAE RHAMNOIDES (*Linn.*)

HYPECOUM PENDULUM (Linn.)

- { **STYLOPHORUM ? NAPALENSE (De Candolle.)**
- { **Meconopsis ? Napalensis (De Candolle.)**

This plant belongs to Stylophorum instead of Meconopsis, if they are made to constitute distinct genera. But De Candolle puts them together as sub-genera, though later and probably better authorities keep them separate. But after all, I believe there is some doubt whether this article belongs to either genus. De Candolle says, "habitus fere Glaucii aut Argémones." "An genus? an sectio propria?"

? JACQUINIA OBOVATA.

PEGANUM HARMALA (Linn.)

Qu? *Euphrenic ? instead of Narcotic.*

FAGUS SYLVATICA (Linn.)

Extract of Husks.

CYNOGLOSSUM OFFICINALE (Linn.)

- { **ECHINOSPERMUM LAPPULA (Lehmann.)**
- { **Myosotis Lappula (Linn.)**

LITHOSPERMUM OFFICINALE (Linn.)

CHENOPODIUM HYBRIDUM (Linn.)

- { **CUCUBALUS BACCIFER.**
- { **Cucubalus bacciferus (Linn.)**

MESEMBRYANTHEMUM EMARCIDUM (Thunberg.)

MESEMBRYANTHEMUM TORTUOSUM (Linn.)

Mesembryanthemum emarcidum, like *Nicotiana Tabacum*, is not Narcotic till it has undergone a certain change in consequence of being treated in a peculiar manner. *Mesembryanthemum tortuosum* is considered as Narcotic without any such change.

LEONOTIS LEONURUS (R. Brown.)

- { **LEONOTIS OVATA (Sprengel.)**
- { **Phlomis Leonotis (Linn.)**

CHAMÆNERION SPICATUM (*S. F. Gr. or Salisb.*)LAGERSTROEMIA REGINÆ (*Rozburgh.*)? DECODON VERTICILLATUS (*Elliott.*)

According to some experiments made by a medical gentleman of my acquaintance, *Decodon verticillatus* was supposed to be a Narcotic; but the experiments were interrupted before they were satisfactory to me; but I know of no reason why this article is as likely to be Narcotic as its coördinate *Lagerstroemia Regi*. I do not consider it as well proved however. This article has long been considered as Ecbotic; but this is scarcely better proof than its Narcotic power. Both these effects may, or may not be due to a single power, as I have already hinted, and shall endeavor to show in a more appropriate place.

The herbaceous part of the next plant is said to have the singular power of intoxicating animals. It seems that the author quoted, considers the power of intoxication as a singular property

PHEGOPYRUM ESCULENTUM (*Manch.*)VACCINIUM ULIGINOSUM (*Linn.*)BRUNSVIGIA TOXICARIA (*Ker.*)HOMERIA COLLINA (*Sweet.*)FIGUS TOXICARIA (*Linn.*)

The following thirteen or fourteen Euphorbiaceous articles may possibly possess some other power beside that of a Narcotic; but I have no sort of knowledge that such is the fact. They are more likely to be Oresthetic than any thing else beside Narcotic, but I know of no evidence that they are so.

EUPHORBIA CAPUT-MEDUSÆ (*Linn.*)EUPHORBIA CEREIFORMIS (*Linn.*)EUPHORBIA COTINIFOLIA (*Linn.*)EUPHORBIA HEPTAGONA (*Linn.*)EUPHORBIA PISCATORIA (*Aiton.*)EUPHORBIA VIROSA (*Willdenow.*)

SAPIUM INDICUM (*Willdenow.*)

HURA BRASILIENSIS (*Willdenow.*)

PHYLLANTHUS VIROBUM (*Willdenow.*)

ANDRACHNE CARDISHAW (*Roxburgh.*)

CLUYTIA COLLENA (*Roxburgh.*)

HYENANCHE GLOBOSA (*Lambert.*)

{ JANIPHA MANIHOT (*Kunth.*)
 Manihot utilisissima (*Pohl.*)
 Manihot Cannabina (*Sweet?*)
 Jatropha Manihot (*Linn.*)

ÆGOTOXICUM PUNCTATUM (*Ruiz & Pavon.*)

It is questionable whether the following four Pangiaceous articles are perfectly simple and pure Narcotics; but if they possess other powers in addition, the fact is nowhere specified within my knowledge. At all events, I believe they are used for their Narcotic power exclusively, and perhaps they possess no other.

GYNOCARDIA ODORATA.

HYDNOCARPUS INEBRIANS (*Vahl.*)

HYDNOCARPUS VENENATUS.

PANGIUM EDULE.

It is very questionable whether the following small group of articles are simple or pure Narcotics; but authors generally mention only their Narcotic power. *Randia dumetorum* is nauseating, and most likely Emetic, and it is not improbable that the rest are so likewise. However, they would seem to be used for their Narcotic power exclusively.

PSYCHOTRIA NOXIA (*St. Hilaire.*)

PALICUREA MARCGRAAVII (*St. Hilaire.*)

CERPHÆLIS RUELLIIFOLIA (*Chamisso & Schlechtendahl.*)

I am no way sure that the last two articles do not possess a greater or less degree of Adenagic power. *Martius* compares

their powers to those of several species of *Palicourea*, hereafter to be mentioned as Adenagic-Narcotics, only he represents them as much more venenose.

{ *RANDIA DUMETORUM* (*La Marck.*)
 { *Gardenia dumetorum* (*Retz.*)

{ *EUOSMIA CORYMBOSA.*
 { *Evosmia.*

The wood.

Different parts of an individual plant some times possess different powers. An article may therefore be located as a simple and pure agent of one class, in consequence of a power possessed by one part, while it is located as a simple and pure agent in an other class, in consequence of a power possessed by another part. Again, a particular part may possess two or more powers, and require location accordingly.

This turma or group of Narcotics is administered solely and exclusively for their sedative effects, under which I comprehend not only their antirritant, but also their anodyne and hypnotic or soporific effects, all which have been heretofore defined. They are equally serviceable, both in chronic and acute diseases. It is to be particularly observed that the simple and pure Narcotics, i. e. those which possess no other power in addition, neither relieve nor aggravate true and proper phlogistic diathesis, nor any of the diseases essentially connected with, or dependent upon, such diathesis, whether the disease is a simple and pure Pyrexia, or a Pyrexia and Phlogosis conjoined, or a simple and pure Phlogosis, if there is any such case. It is one of the most decided mistakes or errors of some of the pathologists of the present period, to suppose that the simple and pure Narcotics are capable of benefiting any true and proper phlogistic disease. This mistake or error has existed for a long time in regard to *Digitalis*, which is an Adenagic-Narcotic; but it is comparatively recent with regard to the simple and pure Narcotics. On the other hand, the simple and pure Narcotics are capable of being highly useful in all atonic or asthenic diseases, and also in all non-atonic and non-phlogistic ones, in which the pathological conditions happen to exist, to the relief of which they are especially adapted,

whether the disease is simple Pyrexia or. Pyrexia and Phlogosis conjoined; or simple Phlogosis, if there is any such case.

Where patients have been strongly prepossessed with the notion that they can not possibly tolerate those articles, which possess a combination of Erethistic, Euphrenic and Antisbestic, along with Narcotic powers, I have seen a conjunction of Erethistics, Euphrenics and Antisbестics, with simple and pure Narcotics, very fairly tried, and found decidedly inferior to the natural compounds of these powers, though better than nothing. This is probably owing in part to the greater simplicity of the natural compounds, and in part to the superiority in quality of the operations and effects of the latter.

I have no knowledge of any Antiphlogistic-Narcotic of vegetable-organic origin, though compounds of Cyanogen with several of the metallic elements at the electro-positive extremity of the scale, must possess such a combination of powers; but with incapability of being employed for their Antiphlogistic power, on account of the greatly superior activity of the Cyanogen. But a Narcotic and an Antiphlogistic power are never indicated at one and the same time; so this combination of powers is not needed in the materia medica.

I doubt not that there are Nausiatic-Narcotics, but I do not happen to be familiar with any that possess these two as different and distinct powers. I have never searched for them, because I do not believe that these two operations are ever indicated together. Entonic or phlogistic diseases, I believe, are never benefited by a Narcotic operation; and I am equally satisfied that atonic diseases are aggravated by a Nausiatic operation. I am aware that this is contrary to the views of many, and yet I believe it as the result of observation and experience, and also as the result of sound reasoning from well established premises. Such a group then as this, according to my views, is not needed in the materia medica.

I suppose also that there must undoubtedly be Leäntic-Narcotics in existence, and yet any material amount of Narcotic power would prevent the use of such an article, at least with the freedom that might be necessary for its fullest Leäntic effects. But Leäntics are mainly valuable in entonic or phlogistic diseases, in which Narcotics are of no avail; and again, in entonic diseases,

to which Narcotics are more especially adapted, Leäntics relax, and gradually exhaust, at least in a moderate degree. In diseases that are neither entonic nor atonic, both operations may be indicated; but this does not render such a compound of powers of any considerable importance.

There is but one Neuragic of vegetable-organic origin, and this is intirely destitute of all Narcotic power. Of course then there are no vegetable-organic Neuragic-Narcotics. But the Cyanids of Lead, Zinc and Mercury are Neuragic-Narcotics of chiminal-inorganic origin; and various other analogous ones may be very easily found. These I shall mention in their proper place.

There are certainly a few Erethistic-Narcotics known, and quite likely many more than I suppose; but as all of them possess other powers in addition, there would seem to be no foundation for a group of mere Erethistic-Narcotics.

TURMA SECUNDA.

NARCOTICA-EUPHRENICA.

There are a few Euphrenic-Narcotics known, but like the Erethistic-Narcotics, all (except perhaps two individuals) have other powers in addition, so that they cannot stand as Euphrenic-Narcotics merely.

{ *AMANITA MUSCARIA* (*Persoon.*)
 { *Agaricus Muscarius* (*Linn.*)

The only evidence that this article possesses any Narcotic power at all, is the supposed fact that, when pushed to a certain extent, it produces coma, like the true and proper Narcotics. No body appears to have investigated whether this supposed coma is truly such, or whether it is not rather the anæsthesia of a Euphrenic. Till a doubtful point is investigated, we are bound to take the simplest view of the matter; and this would be to consider this article as a mere and pure Euphrenic. In order to decide this matter, it must be ascertained whether this article produces the regular Antirritant, Anodyne and Hypnotic or Soporific grades of the operation of a Narcotic; or whether it produces the first three grades of the operation of a Euphrenic; whether it produces true and proper ultimate Narcosis, the suspension of the functions of

VARIABLE

the hemispheres of the cerebrum being genuine coma ; or whether it produces no symptoms at all of ultimate Narcosis, and instead of coma, occasions such a suspension of the functions of the cerebrum as takes place in a Hysteric-Fit, i. e. the anæsthesia of a Euphrenic a little more protracted than usual.

CANNABIS (*Indica*.)

CANNABIS (*Sinensis*.)

CANNABIS SATIVA (*Linn.*)

There are the same doubts about the Narcotic power of the several species or varieties of Cannabis, as about that of Amanita. It is not known that Cannabis proves Antirritant or Anodyne, after the manner of a Narcotic. On some subjects, it seems to prove Hypnotic or Soporific ; but is not this the incipience of its anæsthetic stage of operation ? On other subjects, there is nothing like a Hypnotic or Soporific effect, but the very opposite of it, till the subject becomes anæsthetic. I believe that Cannabis never produces coma, but in its stead Catalepsy, a very singular suspension of the functions of the hemispheres of the cerebrum to be occasioned by an article of the materia medica. I have no knowledge that it ever produces any symptom of ultimate Narcosis, unless we reckon vertigo as such. On the contrary, Cannabis obviates languor and lassitude when it exists ; produces a calm, placid and pleasant sensation ; occasions a peculiar but rather agreeable preternatural wakefulness ; also positive exhilaration, etc. I think, therefore, that the weight of the argument is against the view that Cannabis is at all Narcotic. It seems to me to be more probable that both Amanita and Cannabis are pure Euphrenics ; but as this has not been incontrovertibly decided, I deem it proper to mention these articles in this place ; and I shall also mention them among the simple and pure Euphrenics.

TURMA TERTIA.

NARCOTICA ORÆSTHETICA.

Oresthetic-Narcotics undoubtedly exist, though they are less numerous than some other of the turmæ or groups.

CAPSTUM TOXICARIUM.

Is this article Oresthetic? Some species and varieties of Capsicum are intirely destitute of acrimony and consequently possess no Oresthetic power. I have seen no specification in regard to this article, and I do not happen to be acquainted with it myself.

RANUNCULUS THORA (*Linn.*)

ANTIARIS TOXICARIA (*Leschenault.*)

Perhaps this is not the proper place for this article. The inspissated sap contains a fixed active principle which seems to be a simple and pure Narcotic, while the tree (perhaps all parts of it) exhales an effluvium which is more or less Oresthetic, and which produces an Erythema vesiculare (I believe exactly the variety Rhoïnum, though I do not know this certainly) upon some subjects, though by no means upon all. This turma or group of articles might be very greatly enlarged; but what I have mentioned will suffice in this place. It is quite probable that hereafter I may mention and treat of an additional number.

NARCOTICA ANTISBESTICA.

There are Antisbestic Narcotics; but all, within my knowledge, possess some other power or powers in addition, so that they constitute a turma or group of greater complexity of powers.

TURMA QUARTA.

NARCOTICA TONICA.

SIMARUBA VERSICOLOR (*St. Hilaire.*)

?QUASSIA AMARA (*Linn.*)

The first article contains a little Tannic Acid, and hence it has some times been said to be styptic; but it does not possess a sufficient amount of this principle to make it a medicinal styptic. It has been said to be acrid also; but it is not sufficiently so to render it Oresthetic. The second article has the same reputation as the first, with the exception that it is considered as less Narcotic. I have heard it maintained that even Picræna excelsa possessed some Narcotic power; but though I have used it freely, I never could perceive any such operation. My own experience is therefore contrary to a considerable amount of apparently good testimony. There are many other articles that have the reputation of possessing a combination of Narcotic and Tonic powers, about which I think there is a mistake, such as Humulus Lupulus, Mar-

rubium vulgare, *Lycopus Europæus*, *Lycopus sinuatus*, etc. I do not think that any of these articles are Narcotic, even to the most trifling extent. It is a moderate amount of quite a different power, that has been mistaken for a Narcotic, one in these articles. *Ignatia amara*, *Strychnos* *Nux-vomica*, etc. are commonly reckoned as Tonic-Narcotics; but I do not consider these articles as true and proper Narcotics, though they are excellent Tonics.

TURMA QUINTA.

NARCOTICA STYPTICA.

I should expect a priori to find in the *materia medica* Styptic-Narcotics; but as a matter of fact, I do not know that there are any such articles. Doubtless many of my readers will at once think of

THEA SINENSIS.

Thea or Tea is a most decided Styptic, indeed it is most intensely so; but is it at all Narcotic? I do not know that it is even directly Antirritant, Anodyne or Hypnotic or Soporific, or that it is even capable of producing true coma, or any thing so much like it, as to be capable of being mistaken for it. On the other hand, it is certainly capable of producing every grade of a Euphrenic operation in a most decided degree. First, it may be made to obviate languor and lassitude; second, to produce a calm, placid or pleasurable sensation; third, a peculiar and rather agreeable preternatural wakefulness; fourth, a greater or less degree of positive exhilaration; fifth, an anæsthesia under which I should think that a limb might be amputated without sensation of pain, but not without consciousness of the operation. This anæsthesia is as unlike coma as possible, but it is very like the suspension of the function of the hemispheres of the cerebrum in a Hysterical-Fit—so much like it that I am unable to point out the difference. I am wholly unapprised therefore that Tea ever produces a single unequivocal symptom of Narcosis, either primary or ultimate, while it occasions all the essential symptoms of unequivocal Euphrænia or Euphrasia, both primary and ultimate. So universal however, is the diffusion of the Styptic principle of vegetables, viz. Tannic-Acid (as called by Britons and people of the U.

S. A.) and so extensively is a certain amount of it associated with almost every other active principle in the materia medica of the vegetable kingdom, that it would be surprisingly strange if it should in no case be found associated or conjoined with any individual of all the numerous and various Narcotic principles known even now, to say nothing of the multitude without doubt to be discovered hereafter; and yet, at the present time, I can not remember a single decidedly Styptic-Narcotic. As, however, I can scarcely believe in the possibility and much less the probability that there are none such, I have put down the turma or group, and numbered it with the rest.

TURMA SEXTA.

NARCOTICA ADENAGICA.

CONIUM MACULATUM (*Linn.*)

It is my present impression that all the pharmaceutic preparations of Conium maculatum are not Adenagic. If this is true, I should think that there must be two active principles in the extract which is both Narcotic and Adenagic, though only one is known. If I am right about facts in this case, perhaps one principle exists in the crude plant in an imperfect form, like the radical of Nicotina in Nicotiana Tabacum, and of Indigotina in Indigofera tinctoria i.e. as a compound radical of an Alcaloid requiring oxydation for activity, which is effected only by a certain process, that is not performed in all the pharmaceutic preparations. Here, there appears to me, to be a field for useful discovery in the chemistry of organic bodies.

DIGITALIS PURPUREA (*Linn.*)DIGITALIS FERRUGINEA (*Linn.*)DIGITALIS LÆVIGATA (*Waldstein and Kitaibel.*)DIGITALIS LUTEA (*Linn.*)DIGITALIS MINOR (*Linn.*){ DIGITALIS GRANDIFLORA (*Allioni.*){ *Digitalis achrotenca* (*Jacquin.*)DIGITALIS THAPSI (*Linn.*)

What is the article called Digitalis Epiglottis by the physicians of Southern Europe, and so much used as a substitute for Digitalis purpurea?

PALICUREA AURATA (*Mart. & D. C.*)
 PALICUREA DIURETICA (*Mart. & D. C.*)
 PALIOUREA OFFICINALS, (*Mart. & D. C.*)
 PALIOUREA RIGIDA (*H. B. & K. & D. C.*)
 PALIOUREA SONANS (*Mart. & D. C.*)
 PALICUREA STREPENS (*Mart. & D. C.*)
 PALICUREA TETRAPHYLLA (*Ch. & Schl. & D. C.*)

Palicurea Maregraavii and *Cephaëlis Ruellifolia*, which have already been mentioned among the simple and pure Narcotics, it is quite probable belong here. Perhaps they are too active Narcotics to be used for Adenagic effects, even if they have the power of producing them. These several species of *Palicurea* are said to be Narcotic like *Digitalis*, and at the same time to be both Diuretic and Diaphoretic. They are said also to be effectual for the cure of Syphilitic affections, Cutaneous eruptions, Blennorrhœa vesicalis, and for the resolution of certain tumors. If all this is true, they are most decidedly Adenagic-Narcotics, and therefore I locate them as such.

{ *BRUNFELSIA HOPEANA* (*Hooker.*)
 { *Franciscea uniflora* (*Pohl.*)

Perhaps this article should be reckoned as Cathartic, though I am not apprised that it is capable of ever being used with the least advantage for that purpose.

{ *PHYLLANTHUS CONAMI* (*Swartz.*)
 { *Conami Brasiliensis* (*Aublet.*)

Perhaps this species of *Phyllanthus* does not in fact possess true Adenagic power, and should have been associated with *Phyllanthus viosum* in the first turma or group, viz. the simple and pure Narcotics. But *Phyllanthus Conami* is not only reputed to be Diuretic, but is used as such, while *Phyllanthus viosum* has no such reputation, and is not used for such a purpose. If *Phyllanthus Conami* is diuretic it is doubtless such as a part of an Adenagic operation, since every Narcotic that operates upon a part of the secernment and absorbent systems, I have always found to operate upon the whole of them, at least to a moderate, but still decided degree.

SOLANUM DULCAMARA (*Linn.*)
 SOLANUM GUINEENSE (*La Marck.*)
 SOLANUM NIGRUM (*Linn.*)
 SOLANUM PTEROCAULON (*Dunal.*)
 SOLANUM TUBEROSUM (*Linn.*)

These last five articles though alleged by some to be inert, may easily be made to produce unequivocal Narcotic and Adenagic effects, if they are of a good quality, are properly prepared, and are taken to a sufficient amount.

The Adenagic-Narcotics are among the most valuable of all the turmæ or groups of this class, since many of them are well adapted to the treatment of the Atonic-Phlogotica, in which both their Narcotic and their Adenagic operations are indicated. I have heretofore stated that Narcotics are of no service in the Entonic or Phlogistic Phlogotica, and I shall hereafter affirm the same of the Adenagics; but such is by no means the fact with the Atonic Phlogotica. In a recent attack of Rheumatismus acutus, no operations are so much indicated as these two. Indeed, these two are abundantly adequate to the production of a complete resolution of a very great majority of the cases of this disease, provided they are treated within a reasonable time from their commencement, with a suitable quantity of the medicine, and this rightly managed and without any neutralization of its effects by injudicious measures. It is not true (as many seem to suppose) that any quantity of an appropriate medicine, managed in any manner, and with injudicious accompaniments, will cure any disease. Cases may get well in defiance of such a method, but are not cured by it. Though perhaps the Adenagic-Narcotics are the most effectual for the cure of Rheumatismal Phlogosis, yet they are very nearly as effectual in Podagric Phlogosis, provided there is not too great exhaustion of the vital parts of the system. The Adenagic-Narcotics are also very generally effectual for the resolution of Pneumonitis Typhodes-Catarrhalis; Pneumonitis Typhodes-notha; and even in the Acute Strumous Phlogotica, provided these diseases are treated early, with sufficient efficiency, and without accompanying measures that exhaust the vital powers; or if they are already exhausted, provided they are accompanied with some of the Salts of Oxyd of Quininum or Oxyd of

Cinchoninum, or Alcohol or both in conjunction. The Adenagic-Narcotics very often produce valuable remedial effects in nearly all the diseases of the secernents and absorbents, when they happen to be accompanied by irritation or pain, or both together. Their applications are far more extensive, and their effects far more valuable, than any author within my knowledge, or any physician within my acquaintance seems to suspect. In fact, even the articles of this turma or group, that have been the longest known, are still but little appreciated, in comparison with what they ought to be, owing to the imperfection of professional knowledge of them. This turma or group contains some of the best remedies for Icterus Aurigo or Jaundice, etc. I have mentioned the preceding diseases only as specimens of those to which the Adenagic-Narcotics are especially adapted. If I were to mention the whole, it would make a long catalogue.

I do not think that there are any mere Diuretic or Uragogue-Narcotics, though the several medicinal species of Digitalis are universally reputed to possess exactly this combination of powers and no others; and a considerable number of other articles have the same reputation. All of these, however, that I have investigated, or of whose investigation by others I have had full and reliable testimony, have proved to be Adenagic-Narcotics, their diuretic operation being merely a part of their Adenagic operation, the rest of it being ordinarily overlooked, though obvious enough when proper attention is bestowed upon the subject.

I do not know that there are any mere Diaphoretic or Hidrotagogue-Narcotics, though there are Diaphoretic-Narcotics enough with other powers in addition.

The next turma or group which I am now about to mention, consists of articles that possess a combination of several of the different and distinct powers which I have already mentioned in connexion with the Narcotics.

TURMA SEPTIMA.

ERETHISTICA EUPHRÆNICA ANTISBESTICA DIAPHORETICA.

- { MYRISTICA OFFICINALIS (Linn.)
- { *Myristica aromatica* (La Marck.)
- { *Myristica Moschata* (Thunberg.)

My first knowledge of the medicinal powers of *Myristica officinalis* was derived from cases in which an inordinate quantity had been taken, merely because it was agreeable to the taste of the patient, which will undoubtedly call to recollection the maxim, "*de gustibus non est disputandum.*" Since these observations, I have often employed this article with decided benefit in a number of diseases.

TANACETUM VULGARE (Linn.)

- { **PYRETHRUM TANACETUM (De Cand.)**
- Balsamita vulgaris (Willdenow.)*
- Balsamita suaveolens (Persoon.)*
- { *Tanacetum Balsamita (Linn.)*

My first knowledge of the medicinal powers of *Tanacetum vulgare* and *Pyrethrum Tanacetum* (known popularly by the name of Sweet Tansy) was derived from witnessing alarming cases in which one or the other of these agents had been taken for the production of abortion, for there is a prevalent, though I doubt not unfounded opinion among women generally, that these articles possess Ecbotic powers. From these last three articles, I have many times seen as distinct Erethism, Euphrænia, Antisæsis, Diaphoresis and Narcosis, as from Camphor itself; and the Spasms or Convulsions which they produce are so exquisitely clonic that they constitute a perfectly regular Epileptic Fit, quite as regular as that occasioned by Camphor. How far these three articles are capable of being substituted, in certain cases, with advantage, for Camphor, or when they may actually deserve the preference, I have not investigated sufficiently to be enabled to decide.

CAMPHORA OFFICINARUM (Nees.)

- { **DRYOBALANOPS ? CAMPHORA (Colebrook.)**
- Dryobalanops ? aromatica (Gartner.)*
- { *Shorea ? Camphorifera (Roxburgh.)*

Dr. Lindley says of this plant, that "it is no doubt a genus quite distinct from *Dryobalanops*." He adds that "the figure in Stephenson & Churchill (*iii.* 170) can hardly be intended for this" (*Lindl. Fl. Med. Lond.* 1838, *Pg.* 146.)

PAPAYER SOMNIFERUM (Linn.)

De Candolle describes twenty-six species of Papaver, one of which is doubtful as respects genus. Now it is not a little remarkable that only one of these possesses activity enough to be of any value in medicine, and that the one named should be intirely unique in the materia medica, at least as respects the quality of its Narcotic powers. Indeed, I can now recollect only one other Narcotic (I mean of sufficient activity to be of any value in medicine) in the whole order Papaveraceæ, viz. Stylophorum Napalense, unless with De Candolle we consider Hypecôm as Papaveraceous, as according to Lindley. There is no known reason to conclude that as a Narcotic Stylophorum Napalense resembles Papaver somniferum in any of its peculiarities, in which consist the great value of the latter.

VITIS VINIFERA (Linn.)

The varieties of genuine and pure Wine are so numerous, obscure and uncertain, at least at the present day, and differ so little medicinally (if they really differ at all except in strength) that I shall not pretend to specify any of them in this place, whatever I may do hereafter. In the present state of our knowledge of this subject, I prefer to consider the fermented juice of the fruit of Vitis Vinifera as the only true and genuine Wine, the active principle of which I believe to be a Binhydrite of Protoxyd of Etherogen. It does not appear to me that the other fermented liquors are sufficiently like this to warrant the conclusion that their active principle is the same. It seems to me that there are not yet satisfactory reasons for concluding that even the fermented juice of other fruits contains the same identical active principle. Well fermented and refined juice of the Apple, or in other words Cider, does not appear to me to contain a greater amount of impurities than ordinary Wine, and yet it seems to me to differ too much from Wine to consist of the same active principle in conjunction with the impurities in question. The strongest argument in favor of the identity of the active principle of Wine and of Cider, is the ready convertibility of both into Alcohol, (Unihydrite of Protoxyd of Etherogen,) by the same means, viz. by a temperature of 212° Fahrenheit. If we could suppose a Ternhy-

drite of Protoxyd of Etherogen, it might possibly be imagined that such a compound might be the active principle of some of these fermented liquors analogous to Wine; but two strict chemical compounds of Hydrous Acid, (Water,) with Protoxyd of Etherogen, are as many as all analogy would lead us to expect.

TURMA OCTAVA.

EREETHISTICA EUPHRAENICA ORÆSTHETICA ANTISBESTICA

DIAPHORETICA DIURETICA.

{ ALCOHOL OFFICINALE.
 { *Gravitatis specifiici*, 0.835.
 { ÆTHEROGENII PROTOXYDI UNIHYDRIS?

Varietates.

SPIRITUS VINI GALLICUS.

SPIRITUS SACCHARI OFFICINARUM.

SPIRITUS SECALIS CEREALIS.

SPIRITUS SECALIS JUNIPERATUS.

SPIRITUS MALI COMMUNIS.

SPIRITUS PERSICÆ VULGARIS.

I have specified the six most common varieties of Spirit used in the U. S. A.; viz. Brandy, Rum, Whiskey, Gin, Cider-spirit, and Peach-spirit. The whole number found here and elsewhere, is legion. I never could discover any appreciable difference in their medicinal powers, operations and effects, except what is due to the Terebenthine Essential Oil of Juniper in the Gin. As appears to me, their whole differences consist in flavor, a point of some importance, it is true, with the sick. Under my own observation, Brandy has been preferred by nearly all patients. For myself, I never could induce a patient to take any other variety, for any length of time. There is sooner or later, disgust at the flavor of any and every other Spirit.

Although Wine and Alcohol are both unequivocal and decided Narcotics, the latter being capable of destroying life by this power

and this only, yet larger doses and quantities in the twenty-four hours than are ever employed in medicine, are necessary to produce obvious Narcotic effects; and this with other reasons doubtless, prevents their use in medicine for this operation. At all events, they are never used in medicine expressly as Narcotics, though possibly some of the primary effects of this power may be produced, when they are employed with the greatest freedom. For this reason, these two articles, in strict propriety perhaps, should not have been ranked in the class Narcotics; but there will be found many cases in which an individual article possesses two or more different and distinct powers, not infrequently in an equal degree, and is equally employed for each. Under such circumstances, such articles must be ranked in two or more classes, and therefore Wine and Alcohol may be so ranked.

There are many who seem to think that Papaver, Wine, and the rest of this group of Narcotics may be taken as the types of the whole class, and that all the effects of these articles must necessarily be produced, in a greater or less degree, by the whole. John Murray seems to entertain these opinions. He admits that many of the effects of Papaver and Wine, are never observed from *Digitalis* for example. Nevertheless, he thinks that they actually occur, but in such a transient and fugitive manner as always to be overlooked. He seems to forget the old maxim, "*de non apparentibus et non existentibus eadem est ratio.*" He appears to entertain no definite notion that Papaver and Wine have more than one power; and he seems to think that this is a Stimulant power, the sedation produced by these agents being only the necessary and inevitable consequence of the cessation of the Stimulant operation. In this respect, he only follows John Brown, who merely reversed the doctrine of Cullen, and I believe others of his predecessors, which was that the operation of these articles was that of mere Sedatives, the Stimulation (so-called,) being nothing but the consequence of the resistance of the *vis medicatrix vel conservatrix naturæ* to the Sedation, which I suppose, he thought nature must abhor. John Murray thinks that Brown's and his own view is very much preferable to that of Cullen and others. For myself, I think as Dr. Samuel Johnson thought upon two very different subjects; viz. that it is as difficult to settle the precedence between them as between a Louse and a Flea.

These turmæ or groups, of which I have just finished the enumeration, are the most important of the whole class; in fact, they contain two or three of the most important agents in the whole *materia medica*. The value of these groups depends not only upon the specific powers, which are conjoined, but also upon the superior qualities of the powers as possessed by these articles. And yet (according to all my observations, from the beginning of my knowledge of medicine to the present time) I think that these groups are the least understood by the medical profession at large, and that they are groups, in regard to which there is the greatest amount of unfounded prejudice, not only among patients and nurses, but also among physicians. I never happened to know a physician who had thoroughly investigated the powers, operations, and effects of these groups, who had not likewise investigated in a very thorough manner, all the other medicines that he was in the habit of employing; but I often find those who very well understand a considerable number of other articles, who nevertheless, know comparatively nothing of these groups. How this should be the fact, I can not well understand.

The first three grades of a Narcotic operation; a Euphrasic operation; an Erethistic operation; an Antisbestic operation; and a Diaphoretic or Hidrotagogue operation; are indicated, and are in fact of great importance in some stage of nearly all the acute Febrile diseases of the present period, whether they are simple, viz. Pyretic, Phlogotic, Exanthematic or Dysthetic. These operations are just about as much indicated in the chronic Febrile diseases, of which the simple, the Phlogotic and the Dysthetic, (Hectic) is the principal. The Non-Febrile diseases, in which these same operations are indicated, are (we may well say) almost innumerable.

It is worthy of mention here, that by many who do not recognize but one medicinal power in each and every article of these groups, it is nevertheless supposed that all the useful and agreeable effects of these agents, depend upon one single proximate principle; while all the useless and disagreeable effects depend upon an other proximate principle, which never exerts any desirable influence. This has been put-forth as a general fact, though so far as I am informed, Papaver has always been selected for illustration. The proximate principle which has been selected for all the

good qualities of Papaver to depend upon, is the Meconate of Oxyd of Morphinum; while all the bad ones are charged to the Alcaloid Narcotina, or to some salt of the Oxyd of Narcotinum. This has been much insisted upon in regard to Papaver, and it is always spoken of in connexion with Papaver, as if it were true in regard to every thing else in the materia medica, though I have never known anything else used as an illustration of it. But Papaver has somewhere between six and ten other proximate principles that are as likely to be active as these two. Several of them are Alcaloids, all of which are most likely active, and some of them (as Codeina for example,) are known to be so. Now what part do all these several agents perform? Papaver, as I have already stated, possesses at least five different and distinct powers. Perhaps the advocates for the preceding views, if they were brought to admit the number of powers here specified, might say that there is just an active principle for each; and such an assertion would be just as well founded, as those which I am considering. The truth is that the whole of these views are wholly and entirely groundless, as will at once be perceived by the reconsideration of the fact, that the Alcaloid Morphina possesses the whole of the five powers that I ascribe to Papaver, and produces the operations and effects of them all; and so do the several compounds of Morphinum, and both Morphina and Morphinum are what are called simple proximate principles.

But though the articles belonging to the two last mentioned groups possess several different and perfectly distinct powers, yet a distinct proximate principle is not necessary for the residence of each, as many seem to suppose. When an article possesses even a still greater number of powers, the whole most commonly reside in a single proximate principle. Camphor, which is the Protoxyd of Camphogen or Oil of Turpentine, an individual proximate principle, has the same powers in number and name as Papaver, though they differ somewhat in the quality of their operations and effects. Alcohol, which is merely a Unihydrite of Protoxyd of Etherogen, as a whole, possesses these five powers of Papaver, with two others in addition; viz. that of an Oresthetic and that of a Uragogue or Diuretic. Now all these depend on its integrity as Alcohol, and not upon its component parts, whether proximate or ultimate. Nicotiana Tabacum is Narcotic, Euphrenic, Adenagic, Emetic,

and Cathartic, and yet all these different and distinct powers reside either in the Alcaloid Nicotina, or in some salt of the Oxyd of Nicotinum.

Much has been said within a few years about separating the mere Sedative or pure Narcotic principle of Opium, from the mere Stimulant principle; viz. the Erethistic, Euphrenic, and Antisbestic principle, which of course implies that these powers must reside in different and distinct proximate principles, which is certainly very far from being the fact. It is certainly no more necessary that these powers should reside in different and distinct principles in Papaver, than in Camphor or Alcohol. It is even supposed by French physicians, and their copiers and imitators in this country, that the power of Papaver to produce what I call Ultimate-Narcosis, viz. vertigo, faintness, nausea, epigastric uneasiness, dimness of sight or the appearance of a cloud before the eyes, dilatation of the pupils or contraction of them, as the case may be, is mere Stimulation, i. e. Erethism, Euphrænia, Oresthæsis and Antisbesis, due to Narcotina, while the obviation of morbid irritability and irritation and irritative action generally, morbid morbidity, restlessness and jactitation, the relief of pain and the production of a certain amount of quiet sleep, are the sole salutary effects, and are exclusively due to Morphina or some of the salts of Oxyd of Morphinum. When these French views were first put forth in our country, medical students incessantly applied to me for my opinion of them; and when it became known that I considered them as eminently absurd, I was constantly challenged to defend my own views by numerous physicians who had adopted the French notions; gentlemen, who I suspect would now be scarcely willing to admit that they ever received such opinions. I venture to assert, without the least fear of disproof, that there is not a single true and proper Non-narcotic-Stimulant, i. e. Antisbestic, which is capable of producing a single individual of these symptoms; and the same may be said, with very little exception or reservation of Erethistics, Euphrenics and Oresthetics, which are so universally confounded with Antisbestic, all being called Stimulants. *Cantharis vesicatoria* is a common and familiar example of a Non-Narcotic-Antisbestic. *Rhus venenata*, and several other species, are examples of Non-Narcotic-Antisbestic. *Phosphorum elementarium* is a Non-Narcotic-Antisbestic. Each and

every one of these articles is Oresthetic and Diuretic, or at least Subdiuretic ; but this is of no consequence to my argument, i. e. whether any one of these articles will produce a single individual of those symptoms that I have mentioned as being incorrectly ascribed to Stimulation. Now I have long been in the habit of using them some times in comparatively small doses and quantities in the twenty-four hours, and some times in comparatively large ones, and yet I never witnessed one of the symptoms under consideration, from all the use that I have ever made of them. On the other hand, I venture to say there is not a decided Non-Antisbestic-Narcotic in the materia medica, that will not produce the whole of this aggregate of symptoms. It is barely possible that there may be a few Narcotics of such feeble powers, as to be incapable of producing only primary Narcotic effects. • If such is the fact, they are exceptions to the above statement ; but I cannot specify any such.

The preternatural wakefulness which occasionally results from certain doses and quantities of Papaver, under certain management, and which is esteemed by some as such a disagreeable operation, is likewise ascribed to its Stimulant power. This is correct, if we comprise a Euphrenic power under the term Stimulant ; but if we limit this term to an Antisbestic power, it is not correct. The preternatural wakefulness in question, is the third grade of a Euphrenic operation. It is never produced by a Narcotic, Oresthetic or Antisbestic power. A very different sort of wakefulness is sometimes a part of an Erethistic operation. This statement, which, as appears to me, must be found so palpably correct, and so perfectly indisputable, by every one who will thoroughly investigate the subject, sufficiently evinces the futility of the notion of a separation by a chymical process, of the pleasant and salutary principles of these two groups of articles, from the unpleasant and noxious principles ; or in other words, the principles of one part of their Narcotic and Sedative operation, from the principles of the other part of the same operation. One set of these effects may indeed be obtained separate from the other set ; but this is to be expected only from peculiar modes of management, i. e. by the employment of certain doses, at certain intervals, etc. since the supposed difference in the quality of the effects in question, is merely a difference in their degree or intensity. In

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fact, there is a physical impossibility of the separation so much talked-of. As Narcotic and Sedative powers are intirely distinct from true Antisbestic powers, the two might indeed reside in distinct principles, in which case, they might in fact be capable of separation by chemical means; but by experiment and observation, both these powers have been found to reside in one of the principles of Papaver, viz. Morphina, and also in Oxyd of Morphinum.

Several of the other principles of Papaver are believed to be active; but the number and character of their powers are not well ascertained. Narcotina, the supposed Stimulant principle of Papaver, as it is found in the shops, is a decided Narcotic, and is certainly not more Antisbestic than Morphina, or Oxyd of Morphinum, if it is as much so. Indeed, the very effects ascribed to it, which are called Stimulant, are almost exclusively Ultimate-Narcotic. Magendie, who maintains that Narcotina is active, in opposition to Orfila, who declares that it is inert, and also in opposition to Bally, who agrees with Orfila, says that, when pure, even in a feeble dose, it produces upon Dogs a peculiar stupor, under which the eyes are open, while the animal is dull and motionless, and wholly incapable of being roused; and that he ordinarily dies in about twenty-four hours after being reduced to this state. Magendie says, that by solution in Acetic Acid, the power of Narcotina is very greatly diminished, and yet he says that in this state, it produces the same signs of fear, the same backward movements, the same inability to go forward, the same foaming at the mouth, the same agitation of the jaws, and the same convulsive motions generally, which he considers Camphor as liable to produce—Camphor a powerful Narcotic. Now, though I never witnessed any of these symptoms from the Narcotina of the shops, yet, if we may trust Magendie's statement, he has witnessed them, and they are assuredly not symptoms of Stimulation in the common acceptation of this term, but rather of Narcosis. Admitting that this supposed Stimulant principle of Papaver produces these effects, it is certainly a purer and a more active Narcotic and Sedative than the admitted Narcotic principle. If these are really its effects, it must be somewhat analogous to Vomicina and Strychnina, as well as to Camphor. Magendie seems to take it quite in dudgeon that Orfila should not admit

this operation of this principle; and he adds—I offer to show Orfila, whenever he wishes it, these phenomena which he doubts, and that it is very Stimulant when dissolved in an Acid.

Several of the medical gentlemen of Philadelphia, seem to view this matter in the same manner as Magendie. Now what may be the precise notions of the French medical faculty, and their followers in Philadelphia, in regard to the difference between Narcosis and Stimulation, I know not; but I am unable to discover any principles upon this subject, by which I can decide that an article is a pure Stimulant, which produces such symptoms as these. It is true I have never witnessed from Narcotina, the effects which Magendie specifies, though I have witnessed all the other symptoms that I have heretofore laid down as diagnostic of Narcosis, the whole of which I have often seen from Narcotina, as it is found in the shops, whether pure or not, I have never investigated, though it was reputed to be such.

The last two groups of Narcotics appear to me to be by far the most important articles of this class, since they are capable of very extensive application in all atonic-acute, sub-acute, and even chronic diseases, not only to abate morbid irritability and irritation, etc. to relieve pain, to promote sleep, (for all of them have this tendency when taken freely, though Papaver much more eminently than the rest) beside being very valuable to augment, sustain and support the powers of life, when there is any failure of them. But if there is no distinct and separate Antisbestic principle in Papaver, still when managed in a particular manner, and taken to a certain amount, it is one of the most important Antisbestic and sustaining agents in the *materia medica*. Scarcely anything is of more importance for this power than Papaver in Gangrene, in large and extensive Abscess or Apostem, in Typhus nervosus and other species of Typhus, in Intermittent, and numerous other diseases, of which there will be a more appropriate place to treat hereafter. In order to obtain their Erethistic, Euphrenic, Antisbestic, and where Alcoholis employed, its Oresthetic effects, they must always be given in uniform doses, at regular and comparatively short intervals. When thus managed, their Antirritant and Anodyne effects are also obtained. In single full doses not repeated, or at least only a few times, they are employed to meet pressing emergencies, which thus treated, are only

of short duration. It is too much the fact that these last two groups of agents are used only to palliate and relieve accidental and unessential symptoms; but those who use them in this way exclusively, really know but very little of their great value.

Without doubt, Cullen and his immediate pupils and successors better understood their powers and applications, and employed them more judiciously than any other large body of physicians that ever lived previous to their time. At the present period, their most valuable uses and applications seem to be but little known or understood; and there is as great a deficiency in the best method of managing them. This is owing mainly to a deficiency of knowledge in regard to them, though erroneous pathology has been quite a hindrance to their best uses. There is a current impression widely extended, that they are mere palliatives, and in some cases nothing more than placebos; and that they are wholly incapable of curing any serious disease; and that if they are often used even for these purposes, they are always and sooner or later positively injurious. But nothing can be more unfounded or more incorrect than all this. In appropriate cases, and with proper management, all these articles are capable of entirely suspending and ultimately and radically curing very many diseases. In addition to this, they are highly important auxiliaries to other remedies, in full as many more cases.

There are two principal methods of employing these two last groups of articles, viz. 1. In comparatively or relatively small and uniform doses, at short and regular intervals, giving each dose before the desired effect of the previous one has passed by. By this method, we obtain continuously a greater or less degree of the Erethetic, Euphrenic, and Antisbestic, as well as the Antirritant grade of a Narcotic operation. When the article employed is Alcohol, and it is given as little diluted as possible, we obtain the Oresthetic operation of this agent. If the patient suffers pain, the Anodyne effect is usually produced. 2. In single full or large doses, once or twice repeated in the twenty-four hours, or only as particular symptoms, or any existing emergency may seem to require. By this method, we obtain little more than a very considerable degree of the Sedative effects of these articles; and when managed in this manner they are not curative of any diseases, except such as consist in a single paroxysm, like Gastro-

dynia and Enterodynia for example. In these diseases and others analogous to them, two or three large doses, large enough to arrest or suspend all pain usually cures them intirely, when the symptoms, if not thus met and obviated, would not only produce extreme suffering, but would often continue till they destroy life. I consider that this is the only judicious way of treating Enterodynia, i. e. Colica Ileus. It is now many years since I have treated a case of this latter disease in any other manner; and since I adopted this method, I have never failed to arrest all the cases that I have been called to treat in their first stage. During this time, I have been called in consultation, near the closing scene of numerous cases that had been treated with depletion of blood and Carthartics without relief, till they had passed into a state commonly called Inflammation of the bowels, in which they died.

The first method is generally that alone by which a severe, obstinate and naturally protracted disease can be overcome; and the second, that by which we must meet individual urgent and only accidentally occurring symptoms, or diseases consisting in a single urgent paroxysm. The former is especially calculated to increase and support or sustain the powers of life under protracted disease, as well as to overcome and subdue the urgency of the disease, and to effect that change in the state or condition of the system, upon which the cure most commonly depends. In many cases the latter method only obviates some transiently existing state, that interferes with the effects of other remedies, which may be more appropriate, and upon which we may place our principal reliance for the ultimate cure of the primary malady. For example, a case of Intermittent may be attended with urgent Diarrhœa. Now though Quinine or some salt of Oxyd of Quininum is the appropriate remedy for Intermittent, yet under urgent Diarrhœa, it will often pass-off before it has time to produce its legitimate effects; and even if it did not the Diarrhœa would prevent its curative effects. But by the conjunction of a proper quantity of Papaver, the Diarrhœa is restrained and sooner or later wholly arrested, and the Quinine or the salt of Oxyd of Quininum cures the primary disease.

Independent of the peculiar circumstances of the particular case, nothing definite can be said about the appropriate doses of the Erethistic, Euphrenic, Oresthetic and Antisbestic Narcotics, or

the periods suitable for their repetition. Their effects upon a person in health, will afford no rules, since disease and medicines act and react upon each other in such a manner as to set all abstract rules at defiance, and in fact in such a manner as to modify their effects indefinitely. The nature and intensity of the malady, the prevailing diathesis, the temperament and peculiarities of the patient, but above all, the operative effects of the article, must dictate the quantity, the periods of repetition and the general and particular management. Of opium for example, one grain every six or four hours may be as much for one case, as a grain every hour or even more may be for another. Even in single full doses, one grain may be amply sufficient for one case, while five, or even ten may be a scanty quantity for another.

The propriety of the use of these agents in Typhus nervosus has been controverted and denied. In this disease however, there is almost always more or less morbid irritability and irritation and irritative action in the arterial or nervous system, and often in both, not infrequently with irritative heat and dryness of the skin; more or less morbid sensibility and sensation; more or less morbid mobility, restlessness and jactitation; more or less mental depression and morbid watchfulness; the whole connected with more or less atony, asthenia, or in other words exhaustion of all the subordinate parts of the system which are dependent upon the great sympathetic nerve, in other words, the involuntary nerve of chymical action, nutrition and reproduction. Now the Erethistic, Euphrenic, Oresthetic and Antisbestic, as well as Diaphoretic Narcotics, are by way of eminence the appropriate remedies for all these pathological conditions, and I know of nothing else that is at all to be relied-on for this purpose. What is there beside Camphor, Nutmeg, Papaver, Wine and Alcohol, that will relieve these symptoms. These agents are likewise the only effectual remedies for many accidental and unessential symptoms of Typhus nervosus, such as pain, vomituration (i. e. irritability of the stomach and œsophagus as respects upward peristaltic action) Diarrhœa, etc.

Now it happens that the relative degree of the several powers of these agents varies considerably in these several articles, thus affording us means, by the selection of one or the other, or by the conjunction of two or more of them, of meeting all the indications

with great accuracy and precision. Besides, whenever there is an indication for a still greater degree in proportion of the effects of any one of the powers possessed by these agents, it may always be assisted by the conjunction of some article possessing only the single power, a greater degree of whose effects is required. Why then should there ever have been any doubt in regard to the propriety of the employment of these agents in Typhus nervosus? For myself, I never yet saw a case of this disease, in which some one or more of them was not truly indicated in some quantity or other, and capable of being of greater or less service in one or more, or even all of the stages of this malady.

I have seen non-malignant Typhus nervosus treated very successfully with Papaver alone, administered in uniform doses, at regular and short intervals. Accidental and unessential symptoms, requiring other agents were met and obviated by appropriate measures. The quantity of Papaver in the twenty-four hours was regulated wholly by the urgency of the symptoms and the degree of the susceptibility of the patient. I have known an exclusive treatment of non-malignant Typhus nervosus by Alcohol in the shape of Spiritus Vini Gallicus, to answer admirably. The lower and larger intestines were just cleared of their old contents, in the gentlest manner possible, and then the patient was put upon two fluid drachms of the Brandy diluted with half a fluid ounce of Water, and sweetened with a little Sugar, every two hours. Accidental and unessential symptoms were met and obviated by appropriate means, and the Brandy was either increased or diminished according to circumstances. I have never seen cases get along better than such as were treated in this manner. In fact, I should not have cared for any other articles of medicine by way of auxiliary, except Papaver. I have seen many cases of the same disease treated to my full satisfaction with Papaver and Spiritus Vini Gallicus alone, with the exception only that accidental and unessential symptoms were met and obviated by the appropriate remedies. These cases progressed and terminated in such a manner that no other remedies were indicated. These agents certainly obviate the morbid irritability and irritation; the morbid sensibility, the morbid sensation and the pain of Typhus nervosus far better than any other known. They also obviate the restlessness and wakefulness of this disease, as well as

the languor and lassitude, much better than anything else. They promote Diaphoresis and thus relieve the morbid heat. They not only contribute to prevent atony or exhaustion of all the parts dependent upon the nerve of chymical action nutrition, etc. but they contribute to remove or obviate it, when it already exists. These are certainly the principal indications of treatment in Typhus nervosus. In the forming stage, when the diseased action is weak, and not fully confirmed, I have often known these agents arrest the disease, or in other words produce a resolution of it.

I have often seen all the indications of treatment in severe non-malignant Enteritis Typhodes-nostha vel Dysenterica, or Dysentery, fairly answered by Papaver and Spiritus Vini Gallicus. I have never been better satisfied with the success of any plan of treatment in this disease, than with that by these articles merely. These agents answer all the indications in Dysentery that they answer in Nervous Typhus; and in addition to this, they restrain secretions of air and serum into the upper and smaller intestines, and directly diminish peristaltic action more powerfully than any other articles in the materia medica. As the topical Phlogosis of the lining mucous membrane of the upper and smaller intestines is always atonic and more or less irritative, and as in many respects it is more analogous to Phlogosis Erythematica than to any other species of Inflammation, Papaver and Spiritus Vini Gallicus are altogether the best remedies known for cases of it.

These same remedies are also the best known for Diarrhoea whether acute or chronic. They are the most effectual agents for restraining the secretion of air into the upper and smaller intestines and for moderating and suspending morbidly increased peristaltic action of the intestinal canal, as I said when mentioning Dysentery. The other articles belonging to these two turnæ or groups, though inferior to Papaver and Spiritus Vini Gallicus, are never the less quite valuable and can often be made useful as auxiliaries to these. Camphor is very often conjoined with Papaver. Where patients have had insuperable prejudices against Papaver and Spiritus Vini Gallicus, I have not infrequently made Camphor and Wine answer in their stead, though I did not like them as well. In many cases attended with extreme exhaustion however, the patient may often be raised by Spiritus Vini Gallicus, when this can not be done by Wine. Wine is very much

inferior in power to Alcohol, beside varying greatly from it in the quality of its operation and effects. This latter difference proves conclusively that Alcohol is not the active principle of pure natural Wine.

The articles belonging to this turma or group are less perfectly understood, and more unsuccessfully employed by physicians in general, than any other, in equally common use, unless possibly it may be the Adenagics. When given in single medium doses, they usually produce Euphrenic effects, the Antirritant grade of a Narcotic effect, and this is all that is perceptible or at least obvious. When given in single large doses, a Euphrenic effect, which is but transient and fugitive, and all the medicinal grades of a Narcotic effect are produced. When these direct and primary effects pass-off, which takes place in twelve or fourteen hours, certain indirect and secondary effects very commonly succede, such as nausea, faintness, vertigo or headache on motion or exertion. It is only when given in relatively or comparatively small doses, at regular and quite short intervals, which are very variable in different subjects and different diseases, that we obtain the whole of their effects, viz. their Erethistic, Euphrenic, Oresthetic, Antisbestic and Diaphoretic effects in conjunction with all the medicinal grades of a Narcotic effect.

I have very often known cases and subjects where Papaver was very highly indicated, but in which it could be employed only in doses of a single minim of the Tincture, which in order to accomplish any thing with it, must be repeated every half hour. In such subjects and cases, it is commonly the fact that forty-eight minims given in the course of twenty-four hours, will accomplish as much medicinally as four times this quantity accomplishes in ordinary subjects. Some subjects are so exquisitely susceptible that they can tolerate only exceedingly small doses, without the production of nausea, faintness, vertigo, headache, etc. In such subjects, if we would accomplish any thing with these agents, we must repeat the exceedingly small doses at very short intervals. These are only cases of extreme susceptibility, and not cases of idiosyncrasy. If Papaver should uniformly purge a grown subject, it would prove an idiosyncrasy, but mere difference in susceptibility does no such thing. In all probability the susceptibility of no two subjects is ever exactly the same. An equal difference of suscepti-

bility exists as regards numerous other active articles of the *materia medica*. I have often known subjects in which a grain of Dichlorid of Mercury or an even teaspoonful of Protoxyd of Magnesium would uniformly produce hypercatharsis, and others in which a sixteenth of a grain of Tartrate of Antimony and Potassa would uniformly produce hyperemesis. I once knew a subject who informed me that he could never take a small quantity of reguline Mercury into the palm of his hand for a moment, without the production of a greater or less degree of ptyalism. Very happily after one of these exquisitely susceptible subjects has taken these agents for a certain length of time, he becomes so much accustomed to them, as to be able to take them in the ordinary manner and in ordinary quantities.

By these statements it will be understood that it often requires much sound judgment and considerable tact and skill, which can be acquired only by means of instruction and experience, to manage these articles to the best purpose. When such tact and skill is once fairly obtained, the employment of these articles in the best manner becomes easy. They are the most difficult of all medicines to be employed with much advantage by a mere routine practitioner. In fact to do justice to these articles, and to obtain all the beneficial effects which they are capable of producing, a degree of pains and closeness of observation, as well as dexterity in management, is necessary on the part of the practitioner, which the indolent, the superficial, the desultory, the timid, the rash and the mere routinest, will never bestow or acquire, and which it would be excessively difficult for such persons to attempt and much more to attain to. I am happy however to be able to express my fullest conviction, that there is nothing in medicine beyond the attainment of all those who have had a good preparatory education, who have had good professional instruction, who are properly acquainted with the auxiliary branches chemistry and natural history, and who use due diligence and industry for making the proper attainments from reading and genuine experience. The practical character of a physician may be more accurately judged of, by his skill and tact in the management of these articles, than by his management of any other article or group of articles in the whole *materia medica*. The preceding remarks in regard to these *turmæ* or groups of agents, are much

more especially applicable to Papaver, but they are applicable in a less prominent degree to Camphor and in a less prominent degree still to Wine and Alcohol.

These articles act primarily upon the brain and nervous system generally, the former of which is the acknowledged seat of mind or intellect, and of the emotions and passions, and the latter the instruments of all the sensations, as well as all the motions or actions of the whole system. The state of the mind therefore often has a great and controlling influence upon the operations and effects of these agents. The state of the mind sometimes powerfully counteracts, or strongly coincides with the operation and effects of these agents. If the mind is tranquil, a moderate quantity of Papaver for example produces sleep. If it is agitated, the disturbance is frequently increased by such a quantity of this article. Conceit, whim or prejudice very often indeed helps Papaver to nauseate, when otherwise it would produce no such effect. This I have verified in a great multitude of cases by a perfect experimentum crucis. I have known several cases, where a very large table-spoonful of Tincture of Opium has been taken, by mistake of a phial, for a weak bitter-tonic Tincture, the mistake not being detected till it was too late to discharge it by vomiting. In some of these instances very serious and troublesome effects resulted; while in others, from intense occupation of mind no appreciable effects took place. In a particular case in which this quantity of Tincture of Opium was thus taken, by a man who had never taken a particle of Opium before in his whole life, a physician was consulted, who found that the patient was just about to perform the duty of an auctioneer, at the sale of a large amount of very valuable real estate, and who advised him to dismiss wholly from his mind the mistake he had made and attend to the business in which he was engaged. This he did so effectually that he never thought of it again for about a week, when he was reminded of it, by inquiries made by the physician. If much effect had been produced he could not have forgotten it so perfectly. Had this patient gone to bed and fallen a sleep, it is most probable that a troublesome, perhaps dangerous Narcosis would have occurred. Mental exertion, disturbance or agitation often prevents intoxication from Wine or Alcohol when it would otherwise take place; and a great fright or any other powerful shock

frequently arrests or intirely suspends it, when it previously existed.

The only very troublesome symptoms that I have ever witnessed from Papaver in large quantities in the twenty-four hours, when it has been highly indicated and when it has been given in uniform doses, at very short and regular intervals, have been such a torpor of the urinary bladder as to produce vesical retention of urine; and a very harassing itching of the surface. For the former, Tincture of Cantharis, in proper quantity, and some times the Terebinthine Essential Oil of Pine, called in chimistery Camphogen, are usually very effectual remedies. For the latter, I know of no better remedy than scratching. In one case only (a case of confirmed Phthisis) have I known the itching so troublesome as to constitute a serious objection to the use of Papaver. In this case however, it very effectually mitigated the Cough, almost intirely suspended a very profuse expectoration, obviated difficult respiration and relieved a harassing pain, that seemed to be within the thorax, beside sustaining the powers of life remarkably, so that the patient felt that it could not be dispensed-with, the intense itching to the contrary notwithstanding.

In chronic diseases the medicinal hours of the old physicians, viz. early in the morning, (the earlier the better,) about eleven o'clock A. M. about four P. M. and at bed-time, are generally much better for taking these articles, than twice as large doses night and morning, as is the method of some. It would be better still for the patient to take a dose regularly every six hours, as for example at seven o'clock A. M. one P. M. seven P. M. and one A. M. This would require only one dose in the night, which can be prepared and placed by the bed-side, to be taken when the patient awakes, which will not usually deviate half an hour from the exact time, which will be of no moment in reference to the single dose in the twenty-four hours. The intire night is too long to go without medicine when the patient has Cough or Chronic Diarrhoea or any such disease. In acute diseases, a dose of these articles ought to be taken every three hours at least. This will be only two doses in the night, which can easily be taken even when there is no watcher, and much more when there is one. I am satisfied that patients do not get-along near as well with doses every four or every five hours, even though they take a propor-

tionally larger quantity. In very intense acute diseases, it is often better to repeat the doses every two hours, or even every hour. In many cases of severe Typhus nervosus accompanied with very urgent Diarrhœa acuta, I have often been obliged to repeat the doses every half hour. The Diarrhœa would not be restrained by any other method. My attention has been long turned to the subject of the size of the doses of these, and indeed all other Narcotics, and to the proper periods of repetition; and I am fully convinced that the precepts here laid down, are essential to the best success with these articles and many others.

The number of intense and severe atonic diseases, in which these articles are not indicated in some stage or other is exceedingly small; and certainly in many, they are the principal remedies. Papaver, Alcohol and Cinchona are the three most important remedies in the world, remedies for which there are no substitutes; and two of these belong to the groups which I am now considering. Of all the other important classes, we have so large a number of articles, that if several should be lost to us, we should have a sufficient number remaining. Of what importance would be the loss of one or more, or even a half dozen of our Antiphlogistics? We should still have an abundance remaining. The same may be said of most of the other classes. It is not so however with the most important Narcotics. They are often unique, as are the two groups, of which I am now more especially treating. Sydenham was in general at least, a century in advance of his cotemporaries, and in fact of his successors, in his practical knowledge of some of these articles, and more especially of Papaver. "*Ita necessarium est Opium*" (says Sydenham) "*in hominis periti manu, ut sine illo manca sit ac claudicet medicina.*" It appears by Cullen's clinical practice that he understood these articles much better than could possibly be inferred from his systematic work upon the theory and practice of medicine. Rush appears often to have used some of them, particularly Papaver, exceedingly well, much better than any of his pupils with whom I ever happened to be acquainted. Darwin often used them with great judgment. John Brown by attempting to simplify very far too much, as well as by numerous pathological and therapeutical errors, produced an opposition to his principles, even when they were correct (and they were seldom wholly so) which contributed

to retard the progress of the knowledge of these articles. I doubt not that all these distinguished men understood these articles much better, at least practically, than appears from any thing, which they have left behind them. Still there remained after their labors an ample field for research. Even now I do not suppose that we are acquainted with one half that is to be known with regard to this class of remedies, or even in regard to my two last groups; and yet I know that there is more than twice the traditional or floating knowledge of them, in comparison with what is contained in books.

It is said that Mahomet, in his Koran, among other sensual enjoyments, promises his followers in his paradise "cups of flowing wine" and that "their heads shall not ache by drinking the same, neither shall their reason be disturbed" by it. If Mahomet's promise were ever to be realized in this world, I think that the articles so operating can be found only among the simple and pure Euphrenics, and are not to be looked for among those articles which possess Narcotic, Erethistic, Antisbestic and other powers in addition to a Euphrenic power. A distinguished American physician says in reference to this passage of the Koran, that "although these two specifications of Mahomet are perhaps among the most obvious inconveniences of a free and more or less excessive "drinking of Wine, there is nevertheless another difficulty which attends even a moderate habitual use, that far outweighs the effects of casual intoxication, or intoxication not confirmed by regular or frequent and continuous repetition." "In the latter case, the evils of habitual intoxication are combined with the evils referred to." "The moderate habitual and daily use of Wine, and certain other Narcotics, such as Alcohol, Papaver, Nicotiana, etc. soon produces an artificial and more or less morbid condition of the system, which makes the agent indispensable to the comfort of the consumer, and more necessary for the preservation of the ordinary activity of body and mind than any article of food, and this without approaching to abuse" of the agent, "in the ordinary acceptation of the term, i. e. in the language of Mahomet without disturbing the head," (as respects common sensation or pain) "or the reason." "The person becomes miserable without his ordinary doses, however small, of Alcohol, Wine, Cider, Ale, Nicotiana, Papaver, Tea, etc. though some of these articles are very much less objec-

tionable than others." "Whoever uses" (certain) "Narcotics without sensibly affecting the head," (as respects pain) "or the reason, is commonly called temperate, and this state it is desirable never to exceed in their employment, either for ordinary support, or as medicines, when the ends" desired "can in any wise be obtained without proceeding further." "Thus far, the effect may be said to be negative (for the want of a better term) the system apparently being only brought-up to a healthy state, without positive excess of excitement or exhilaration, or increased muscular power or activity." "There is rather an exemption from lassitude than any obvious additional strength." "If this rule is rigidly and regularly adhered to, the increased expenditure of vitality is scarcely appreciable" (if indeed any takes place) "and the system so far accommodates itself to this second nature, that often perhaps, it does not suffer at all." "This negative state is not however sufficient for conviviality, nor for producing any uncommon effort, either of body or mind." "For these purposes, a quantity is to be taken as large as possible, without appreciably affecting the head" (as respects pain, etc.) "or the reason; and when this stage has been arrived-at, there ceases to be any definite limit beyond." "After this, complete intoxication is liable to take place, and this by a sufficient number of repetitions, becomes a habit and the victim soon sinks so low as to suffer almost the torments of the infernal regions, when he is not under a greater or less degree of the influence of the intoxicating agent." "It is the strong sense of vacuity, the lassitude, the prostration of body and mind, with the uneasiness, the restlessness, the agony (as perhaps it may be called) ensuing the entire omission of the accustomed intoxicating agent, the whole amounting to real and true disease as respects the body, and to insanity as respects the mind, that make habitual intemperance so difficult to be overcome." "All unnatural physical" (but true and genuine) "habits may be changed and overcome, with comparative ease, except the disease" (falsely called a habit) "that arises from the protracted use of certain Narcotics." "The feelings, affections and passions hurry the understanding away, so that usually it has not power sufficient to obey the will." "The habit of temperately using certain other Narcotics produces the same effects in kind, though it is not so inveterate as absolutely to control the will" (as in the case of

Alcohol and Wine) "but it makes it very difficult for the understanding to exercise its lawful jurisdiction." "In this respect however the morbid effects of using certain individuals of the Narcotics, are more easily overcome than the morbid effects of others." "The effects of the habitual use of very strong Tea are in all probability the most easily counteracted; of Cider and Wine perhaps the next; of Tobacco, Opium and Alcohol the hardest, bearing in mind that I mean the effects of such a use of these articles as, in the common acceptation of the term, is within the bounds of temperance." "The effects of positive and habitual intemperance, or of frequent complete intoxication with Alcohol, as they are the most common, so they are certainly the most difficult of all to be overcome." "This is the reason that here is the proper place to draw the line for the prevention of intemperance, that it is proper to prohibit the use of Alcohol in all cases, except literally and strictly as a medicine, and that more especially in acute diseases."

I have made this quotation for the purpose of commenting upon it, since it is the deliberate view and opinion of a very distinguished physician (not long dead) who well knew the value, importance and in fact the necessity of these two last groups of Narcotics in the practice of medicine, and withal entertained no extravagant and ultra views upon what is called temperance, at the present period. I do not hesitate to say that there is a very considerable amount of gross error in these statements, as they will doubtless be understood. The principal source of the error in question consists in and depends upon the fact that articles possessing from four to six different and perfectly distinct powers, each producing its peculiar effect under peculiar modes of management, are treated of and probably considered as possessing only a single power, and of course, as exerting only a single operation, though the effects can not be denied to be manifold. All of these articles seem to be reckoned as mere Narcotics, while in fact their Narcotic power has no influence whatever in the production of any of their chronic morbid effects. The coma of a paroxysm of intoxication, or in more popular terms, a fit of drunkenness, is doubtless an effect of the Narcotic power; and if just enough of any of these articles is taken at once, all of them (except perhaps Alcohol and possibly Wine) are capable of producing that aggre-

gate of symptoms which I am in the habit of calling Ultimate-Narcosis. In the first place there are no truly intoxicating agents in common use, except Alcohol and Vinous liquors; and I know of but one more agent in the world, that can with any shadow of propriety be considered as truly intoxicating in a manner at all analogous to Alcohol and Wine; and even this is doubtful in this respect.

In the second place, the chronic morbid effects of intemperance in the use of Alcohol are very materially different from the chronic morbid effects of intemperance in the use of true, genuine and pure Wine; and there is no sort of reason, as I have already said, to conclude that any of them are due to the Narcotic power of either agent. A Narcotic given in excess produces immediately that aggregate of symptoms which I am in the habit of calling Ultimate-Narcosis; and if pushed to a sufficient extent, it may destroy life, in one of the modes which I have already specified; but as I have already inculcated, I know of no chronic morbid effects that are producible by any simple and pure Narcotic. In the third place, it is not for the effects of the Narcotic power that Alcohol, Wine, Papaver, Nicotiana, etc. are customarily taken without a "*nodus vindice dignus*;" nor is it the Narcotic operation that renders a subject so exceedingly uncomfortable, when not under the influence of these agents, provided the patient has previously been accustomed to take them in any notable quantity, for any considerable length of time.

That power for whose operations and effects they are taken, when existing in a simple and pure state in any article, so far as I have ever been able to learn, never produces any other morbid effect, except the extreme uncomfortableness, when the subject of their protracted use is not under their influence. This affection is primarily and mainly referred to the stomach, although secondarily it seems to involve the whole nervous system to a greater or less extent. This has always seemed to be essentially the same affection as *Limosis Syncoptica*, and I have therefore considered it as a mere variety of that affection, and have called it by that name. Now if what I have just stated is true, it follows that none of the other chronic morbid effects of the use of Alcohol and Wine, except the *Limosis Syncoptica*, results from this power, unless we conclude that, as possessed by Alcohol and Wine, it has

very peculiar qualities, which it is destitute of, as possessed by every other agent. Certainly nothing else having this power, will produce the chronic morbid effects either of Alcohol or Wine any more than any other Narcotic will produce them, though there would seem to be many other articles that possess this power in an equal degree with either.

The peculiar chronic morbid effects of Alcohol and Wine, different and distinct from Limosis Syncoptica are not the result of a mere habit, as is so generally said, and as would seem to be so universally believed; but are the regular operative effects of some power or powers, perhaps hitherto unrecognized and non-descript. Limosis Syncoptica however, in some grade or degree, some times it is true, a very slight one, always results from a regular and protracted use of every article having the power which alone occasions it, provided this power exists in any material degree. I have had my doubts whether Tea and Coffee, as ordinarily prepared and drank, ever produce any appreciable degree of it, though doubtless they might be used of sufficient strength, and in sufficient quantity to accomplish this, and quite probably they may have been so used. They are not however so used by the great body of Tea and Coffee-drinkers in that portion of the world, which employs them as regular and daily beverages.

As appears to me, it is quite certain that none of the ill effects of the intemperate use of Vinous and Alcoholic liquors with the single exception of a certain amount of Limosis Syncoptica, ever result from the use of any other agents at present known. It may be thought by some, that Papaver should be placed in the same category with Alcohol and Wine; but I am perfectly satisfied that its protracted use never produces any other disease of any other sort or kind, except Limosis Syncoptica. Scarcely any body ever resorts to its use except those who are greatly diseased; and whenever it effects a complete cure, its use is discontinued in a very great majority of cases. When the disease is incurable, this agent is often continued for the palliation of extreme suffering, or for arrest of some symptom that is dangerous to life; and thus life is often protracted indefinitely, and comparative comfort procured. Soon however the subject acquires the reputation of being an Opium-eater, and then all the effects of the previous disease are ascribed to this drug. In other cases, when the subject has ac-

quired the reputation of being an Opium-eater, all the effects of a long life of debauchery and intemperance in the use of Alcohol before he ever took a particle of Papaver, are ascribed to this article subsequently taken for the relief of a dangerous symptom, as urgent Chronic Diarrhoea for example; and all this through the ignorance and prejudice of the ascriber, if from no worse motive. I have taken great pains to investigate personally all the facts of upwards of fifty cases, in which from an ounce to an ounce and a half (Troy weight) of Opium had been taken every week, between twenty-five and thirty years, and I never found any disease to result from it, except Limosis Syncoptica. On the contrary the diseases for which this agent has been taken, have usually been greatly palliated by it, life has been protracted some times to old age, when otherwise the disease must have terminated it speedily; and beside all this, it has procured the subject a remarkable immunity from many epidemics and sporadic diseases, such as Catarrhus communis var. epidemicus and var. sporadicus, i. e. Influenza and Common Cold so called. When some times the subject is attacked with some of the severe epidemics, the disease occurs in a much mitigated form, and is far easier of treatment. The results of my own investigations and researches on this subject, have been confirmed in the most decided and unequivocal manner by those of acute and intelligent physicians, who have had opportunity, in foreign countries, to examine thoroughly some of the cases, which have afforded ground for so much declamation upon the horrors of Opium-eating, which have uniformly and invariably been found to be the effects of severe and formidable maladies, in fact greatly palliated and mitigated by the Papaver.

I have some times taken charge of a subject with incurably shattered health and constitution, and apparently near the end of life, and by putting him on the use of Tonics and Antisbestics, and a stated use of a moderate quantity of Papaver for a Chronic Diarrhoea, made this patient comparatively comfortable, and protracted his life for many years; but subsequently have always been charged, by all the wiseacres, (who consider themselves as knowing more of medicine without ever having studied it a minute, than men who have devoted their lives to it) with producing all the symptoms that the patient had ever had for twenty

years previous, by the Papaver which I prescribed. No testimony to the real facts will ever produce any thing like conviction of the truth in the persons who propagate such slanders. It would be easier to withstand a tornado with a parlor-bellows. I have very often been accused in this way myself, and have known others so accused literally hundreds of times, and this very frequently by persons that are looked-up-to as exemplars of morals and even of religion. I therefore very well know how much tales of Opium-eaters are worth.

Although I view the ordinary use of *Nicotiana Tabacum* as a very coarse, ungentelemanly, and in fact disgusting and loathsome practice, yet I have never met with any morbid effects from it, as Tobacco, notwithstanding the strong and extravagant charges that are not infrequently brought against it, by certain persons of the present period. I have however seen dangerous morbid effects from the intire suspension of its use, after it had been regularly employed with great freedom, for a long course of years, by subjects of a certain temperament and diathesis. From such opportunity of observation and research as I have had, I can not entertain a particle of doubt, that the use of *Nicotiana Tabacum* under certain circumstances, by persons in no degree sick, is often highly useful, offensive to others as the practice is. There are however other articles, that are capable of producing all its desirable effects, without any thing more offensive than in the use of Tea or Coffee. Such being the fact, I think that the use of Tobacco ought not to be tolerated in any society having pretension to any thing like common refinement. At all events, the use of Tobacco, ought to exclude a man from the company of ladies, till he has been thoroughly purified from the stench of such an article, either with Ohlorine, or even Brimstone, which is quite an elegant perfume, in comparison with stale Tobacco-smoke. It is at present difficult to pass along the foot-walks of any of our larger towns, without having stale Tobacco-smoke blown into the face, or being bespattered with Tobacco-juice spit upon you, and this every few rods.

I have submitted these considerations in this place, for the purpose of contributing to remove a totally unfounded prejudice against Narcotics, which seems to be now entertained by almost every body, whether belonging to the medical profession or not. The power for which the articles that I have just been considering

are taken habitually, and which produces *Limosis Syncoptica*, and no other morbid condition, will soon be treated-of, in its regular and proper place, where I trust I shall give all the further explanations that may be necessary to render this subject as clear as it is capable of being made with my present knowledge of it.

This is perhaps the place where I ought to mention several species of the genus *Lactuca*, which have so long (as I think undeservedly) held a place in the *materia medica*. They are all invariably compared with *Papaver*, being represented as producing all the agreeable and useful effects of that article, and none of the disagreeable and useless ones. It is utterly impossible that such a character as this should be true; and the very ascription of it to any article, savors either of exceedingly imperfect knowledge, or of something worse. It will at once be obvious that the very powers which produce agreeable and useful effects, when the agents are given in doses and quantities exactly appropriate to the exigencies of a case, must produce disagreeable and injurious effects when the agents are given in inordinate and excessive quantities. This statement is most certainly true of every agent of any material amount of power. A feeble *Leäntic* for example, may not be capable in any doses and quantities, of proving disagreeable or of doing much mischief. As early as the latter part of my professional pupillage, I had opportunity to witness the frequent employment of preparations of *Lactuca*, and even then, I began to doubt its powers, as I never saw any operative effects from it. After I began the practice of medicine myself, I prescribed this article again and again, and quite often for a considerable time, and in various doses and quantities in the twenty-four hours, but always without witnessing any operative effects from it. I first became sure that it was incapable of producing either *Erethism*, *Euphriënia*, *Antisbësis* or *Diaphoresis*, the majority of the effects produced by *Papaver*. I next set-about ascertaining whether it was capable of producing *Narcosis* in any degree; and I soon became satisfied that it was not. But as my testimony is merely negative of the medicinal powers of *Lactuca*, I shall hereafter, and in a more proper place, give a summary of the evidence (so far as it is such) in favor of the activity of *Lactuca*, followed by the essential facts of the repeated experiments which at different times, I have caused to be made. It may be proper to state here

that the wild species of *Lactuca* principally used in medicine in Europe are *Lactuca virosa* (*Linn.*) *Lactuca Scariola* (*Linn.*) and that the wild species principally employed where I have lived are *Lactuca elongata* (*Muhlenberg*) *Lactuca integrifolia* (*Bigelow*) and *Lactuca sanguinea* (*Bigelow*) if the last two are in fact distinct species from the last but two. The cultivated species which I have been in the habit of seeing employed are *Lactuca sativa* (*Linn.*) *Lactuca crispa* (*Bauhin*) *Lactuca capitata* (*Bauhin*) and *Lactuca longifolia*, if the last three are distinct species from the last but three. I consider that it is of some importance to distinguish each of these, but deem it very immaterial in the materia medica whether it is as species or varieties. In Torrey's and Gray's Flora of North America, *Lactuca integrifolia* and *Lactuca sanguinea* are merged in *Lactuca elongata*, and but one other unequivocal species is described, viz. *Lactuca graminifolia* (*Michaux*). *Lactuca Ludoviciana* (*De Cand.*) is mentioned, but as a doubtful and obscure species.

TURMA NONA.

EMETICA.

PARIS QUADRIFOLIA (*Linn.*)

It is my present impression that the fruit and leaves of this article are Narcotic but not Emetic; while the root is Emetic, but perhaps not Narcotic. If such is the fact, the former parts ought to have been ranked as simple and pure Narcotics; and the latter part as a simple and pure Emetic. It is quite probable however that in the fruit and leaves, the Narcotic power only predominates over the Emetic power; while in the root, the Emetic power only predominates over the Narcotic power. If such is the fact, the present location is undoubtedly the right one. Although I mention but one article belonging to this group, there are doubtless many more that might be referred to it, but they are either very little known or very rare articles, and therefore I omit them.

TURMA DECIMA.

ADENAGICA EMETICA.

GUSTAVIA BRASILIANA (*De Cand.*)

I might mention many articles belonging here, so far as we are acquainted with them; but as they are imperfectly known, and may possibly possess other powers in addition, I omit them. Even the article which I have mentioned, may be in this predicament; but if it is, I am ignorant of it.

TURMA UNDECIMA.

CATHARTICA.

CORONILLA VARIA (*Linn.*)

ANDA'MARTII (*Hoffmansegg.*)

{ ANDA BRASILIENSIS (*Raddi.*)
{ *Anda Gomesii* (*Adr. de Juss.*)

GONOLOBUS MACROPHYLLUS (*Michaux.*)

There is good authority for this last article's being such an active Narcotic, as to have been used by the aborigines of the U. S. A. as an arrow-poison. This power is supposed to reside in the juice of all parts of the plant, as no particular part is specified. There is still better authority for the root's being a Cathartic, acting like *Citrullus Colocynthis*. I once procured a parcel of the root for investigation. I could not ascertain the period of the growth of the plant nor the season of the year when it was obtained, nor whether it was washed before drying or not. It is certain that collection at a wrong period of the growth of a plant, and at a wrong season of the year, and above all, washing an article thoroughly in water before it is dried, some times render an active article nearly or wholly inert. It is certain that the specimen that I had was several years old. Such as it was, it was repeatedly taken, every additional time, in a considerably enlarged dose, but without any effects of any sort. As the article was both inodorous and insipid, I suspected that it must have been spoiled before it came into my possession, and so I attached no importance to my trials of it.

TURMA DUODECIMA.

ADENAGIA ? CATHARTICA.

PASPALUM SCROBICULATUM (*Linn.*)

Preface to the Class Narcotics.

I presume that there are many other articles belonging to this turna or group; but I have no list of any more, except such as are Emetic in addition.

TURMA DECIMA-TERTIA.

EMETICA CATHARTICA.

ABRUS PRECATORIUS (*Linn.*)

The root of this article is agreed to be very like that of Glycyrrhiza glabra in all respects; but it is not for that part that it is mentioned here, as will at once be obvious. It is the seed that brings it into this class. Numerous authorities say that this part is actively Narcotic and drastically Emetic and Cathartic. A late authority however maintains that these seeds are perfectly inert; but no mention is made of the manner in which they were tried, or in what state and stage of their growth or age, etc. A third authority says that if these seeds are swallowed whole, they are utterly indigestible, and therefore inert; but that if they are swallowed in powder they are active as above represented. It is very frequently the fact that perfectly full-grown but unripe seeds are active, while perfectly ripe ones are inert. Again recent seeds are active many times, when old ones are inert. Both of these circumstances are worthy of regard in observations for determining whether these seeds are active or not. From the weight of authority in favor of their activity, I think they ought to be so considered, till proper research has proved the contrary.

TURMA DECIMA-QUARTA.

ORESTHETICA EMETICA CATHARTICA.

LYCOPODIUM CLAVATUM (*Linn.*)

{ LYCOPODIUM RUBRUM (*Chamisso.*)
{ *Lycopodium Catharticum* (*Sir W. Hooker.*)

LYCOPODIUM SELAGO (*Linn.*)

TURMA DECIMA-QUINTA.

ADENAGICA EMETICA CATHARTICA.

GRATIOLA OFFICINALIS (*Linn.*)

VANDELIA DIFFUSA (*Linn.*)

Perhaps this article may not be really Narcotic. It is said to have all the properties of *Gratiola officinalis*, and may be used as a substitute for it. That article is said very certainly to be Narcotic ; but its Narcotic power is not commonly recognized in the systematic Works. Whether the author who specifies the powers of this agent by comparison with *Gratiola*, recognized it or not, I can not certainly say ; but he wrote in the country where the Narcotic power of *Gratiola* is best known, and therefore we are bound to conclude that he recognized it. But further investigation is necessary before we can feel any certainty on the subject.

APOCYNUM CANNABINUM (Linn.)

APOCYNUM PUBESCENS (R. Brown.)

APOCYNUM HYPERICIFOLIUM (Aiton.)

APOCYNUM ANDROSÆMIFOLIUM (Linn.)

Dr. Asa]Gray considers *Apocynum pubescens*, and *Apocynum Hypericifolium* as varieties of *Apocynum Cannabinum*. I have always been in the habit of distinguishing them ; but a point decided by Dr. Gray is not to be lightly objected-to. The specimens of *Apocynum Hypericifolium* that I have been in the habit of meeting-with have always differed much more from *Apocynum Cannabinum* than the specimens of *Apocynum pubescens*.

PHYTOLACCA DECANDRA (Linn.)

{ *ARALIA ACCULEATA.*

{ *Aralia spinosa (Linn.)*

This plant is not spinose but only aculeate. A name implying such a palpable error should no longer be tolerated.

COLCHICUM AUTUMNALE (Linn.)

COLCHICUM VARIEGATUM (Linn.)

I have considerable doubt whether these articles are Narcotic or Erethistic. I do not think they are both. Whenever I have any doubt between these two powers I always put the articles down as Narcotics, because that is the universally received opinion, which should be followed, whenever there is not good evi-

dence to the contrary. When of a good quality and well prepared, these two articles are eminently and powerfully exhausting, so much so, as to render it hardly safe to employ them with much efficiency. I have seen a number of deaths produced most unequivocally by the first, under the management of careful, discrete and even timid practitioners. Probably the previous exhaustion of the patient was not appreciated. Even when life has not been endangered by the first, I have often seen cases in which the tone of the stomach and of the rest of the alimentary canal was so greatly impaired by it, as to be difficult of recovery, though it was ascribed to the disease (which had no such tendencies) instead of the medicine. As I have often seen this article used, I have thought it a very happy circumstance that the preparation happened to be very nearly worthless. Notwithstanding all this, I do not know that this article is Antiphlogistic, though I should think that it might be. For aught I know, its Narcotic or Erethistic power, or its Adenagic and Emetic power might be in the way of its employment in phlogistic or entonic diseases. I believe it may be considered as certain that both an Erethistic and an Emetic operation, are contraïndicated in phlogistic or entonic diseases. Were such a class as *Analgica* (i. e. articles which exhaust, whether Antiphlogistic or not) admissible, this article would belong to it very decidedly. Perhaps however, it will yet be ascertained to be truly Antiphlogistic.

ANDIRA ANTHELMINTICA (*Bentham.*)

ANDIRA INERMIS (*H. B. & K.*)

ANDIRA RETUSA (*H. B. & K.*)

ANDIRA ROSEA (*Martius.*)

ANDIRA SPINULOSA (*Martius.*)

ANDIRA STIPULACEA (*Bentham.*)

ANDIRA VERMIFUGA (*Martius.*)

GEOFFRÆA SPINOSA (*Linn.*)

GEOFFRÆA SPINULOSA.

GEOFFRÆA VERMIFUGA.

Are not the last two identical with *Andira spinulosa*, and *Andira vermifuga*? I suspect that they may be.

BAPTISIA TINCTORIA (R. Brown.)

Is this article in reality Narcotic? It is reported to be so by every one that I have known, who has been in the habit of using it. I have used it but little, but in that little, I never saw any Narcotic operation. It contains Indigo, and there is a prevalent but mistaken opinion that that substance is Narcotic. I have always suspected that this is the foundation of the ascription of Narcotic power to this species of Baptisia. I may be in an error however.

ARGEMONE MEXICANA (*Linn.*)

ARGEMONE ALBA (*Rafinesque.*)

These two articles are reckoned as distinct species by some, and as I believe correctly. By others they are reckoned as mere varieties. They seem to me to have permanent peculiarities, which are never subject to variation from accidental causes, and which are always continued by regular reproduction. They do not seem to be capable of producing a hybrid. I have cultivated them together for a long time, and never yet saw any intermediate forms, or any approximation in their characters. I believe these to be legitimate species, and not varieties, however great the weight of authority against me. They are generally reputed to be Narcotic; but (as I very strongly suspect) incorrectly. But I have never made any trials or experiments with them, which entitle me to contradict the commonly received opinion; and so I arrange them accordingly.

TURMA DECIMA-SEXTA.

**EUPHRENICA SUBORÆSTHETICA ADENAGICA EMETICA
CATHARTICA.**

NICOTIANA FRUTICOSA (*Linn.*)

NICOTIANA LANGSDORFFII (*Nees Weinm.*)

NICOTIANA PANICULATA (*Linn.*)

NICOTIANA PERSICA (*Lindley.*)

NICOTIANA QUADRIVALVIS (*Pursh.*)

NICOTIANA RUSTICA (*Linn.*)

NICOTIANA SINENSIS (*Fischer.*)

NICOTIANA TABACUM (*Linn.*)

In their living and natural state, the several species of *Nicotiana* are said to be destitute of activity. At all events it is considered to be certain that the Alcaloid *Nicotina* does not exist in its perfect state, in the living and natural plant, but only its compound radical H. C. N. The composition of this compound radical differs from common Camphor, only in the substitution of one equivalent of Nitrogen, for one of Oxygen. Before Tobacco is used, it is made to undergo a process, during which the compound radical of *Nicotina* is Alcalized by combination with Oxygen. The Alcaloid *Nicotina* in its perfect state, destroys life by suspending the functions of the nerve of chymical action, nutrition and reproduction. The Empyreumatic Essential Oil of *Nicotiana*, is undoubtedly factitious. It destroys life by suspending the function of the involuntary nerves of expression and respiratory motion. If *Nicotiana* is active in its living and natural state, it must contain some other active principle; but none is at present known, so far as I am informed.

{ *ANAMIERTA PANICULATA* (Colebrooke.)
 { *Anamirta Cocculus* (Wight & Arnott.)
 COCULUS PLUKENETHI (De Cand.)

It has been supposed by some that all the active Narcotics are necessarily what I call Adenagic, because they some times produce a speedy resolution of certain exquisitely atonic and irritative Phlogoses; but Phlogoses of this character are so much dependent on mere irritation, that it is much the most probable that the active Narcotics relieve such cases merely by virtue of their Narcotic-Antirritant and Sedative power. Although the essence of even true phlogistic or entonic Phlogosis is not the preternatural increase of vital energy and strength of action that attends it, yet the obviation of this, in such cases, effectually removes the disease. Now in like manner, though irritation may not be the essence of exquisitely atonic and irritative Phlogosis, yet the perfect obviation of all irritation, in these cases, may possibly be adequate to break-up and arrest the disease, precisely as the obviation of the entony breaks-up and arrests phlogistic Phlogosis.

NARCOTICA CHIMICA.

There are no Narcotics of chiminal inorganic origin, except the compounds of Cyanogen. As this however is a medicine of considerable importance, and as Cyanogen is a gaseous substance, and therefore can not be given uncombined, unless some of the substances now reckoned as isomeric with it, are in fact Cyanogen itself in a concrete state. This article then must be given in a state of combination, as will at once be obvious. But the combination with Hydrogen, in which it was first employed, viz. as Protocyanid of Hydrogen, or Cyanohydric Acid (though it is not sour to the taste, does not redden blue vegetable colors, nor is it known to combine with any salifiable base to form a salt) is too readily and too speedily decomposable to be either convenient or safe in medical practice. Compounds of Cyanogen with elements which neither possess nor impart any other power, are therefore much needed. Beside this, the conjunction of the pure Narcotic power of Cyanogen with the powers possessed or imparted by various elements or compound-radicals often constitute very valuable medicines, in numerous diseases. In all of these compounds, the Cyanogen is so fixed that it is of uniform strength as a Narcotic, and consequently in a given case, and a given subject, the doses and the quantities in the twenty-four hours may be uniform. In addition to this, such a compound may commonly be selected, as may be taken either in powder, confection or pill, or even in solution, according to the prejudices, humor or preference of the patient. The following catalogue consists mainly of such compounds of Cyanogen, as I have prepared and employed myself, or such as have been prepared and employed by my professional friends and acquaintance.

TURMA PRIMA.

PURA.

The compounds of Cyanogen with the five following metals, I rank as simple and pure Narcotics, not withstanding the medicinal activity of Bisulphate of Alumina and Potassa, and of Proto-nitrate of Silver; and also not withstanding a distinguished author says "twenty grains of Sulphate of Nickel made a Dog

vomit;" that a "drachm of Sulphate of Manganese killed a Rabbit." I will not here pause to decide whether the inactivity of these metals in these compounds is due to inertness, or to the smallness of the quantity in combination with a dose of Cyanogen.

ALUMINI SESQUICYANIDUM.

MANGANESI PROTOCYANIDUM.

NICOLI PROTOCYANIDUM.

COBALTI PROTOCYANIDUM.

ARGENTI PROTOCYANIDUM.

TURMA SECUNDA.

NEURAGICA.

PLUMBI PROTOCYANIDUM.

TURMA TERTIA.

ORÆSTHETICA.

AMMONII PROTOCYANIDUM.

TURMA QUARTA.

TONICA.

CINCHONINI PROTOCYANIDUM.

QUININI PROTOCYANIDUM.

CINCHONINI PROTOCYNIDI DICYANOFERRIS.

QUININI PROTOCYANIDI DICYANOFERRIS.

FERRI SESQUICYANIDI DISOXYFERRIS.

? HYDROGENII PROTOCYANIDI DICYANOFERRIS.

The last substance is commonly supposed to possess tonic power, though I think that this may well be doubted. In the Dicyanoferrite of Protocyanid of Hydrogen estimating a medium dose by the Cyanogen, seven grains of Iron would be divided into twenty-six doses. This appears to be too small a quantity to expect any Tonic effect from. But it is said that it modifies the

effect of the Cyanogen, though in what manner, is not specified, and I suspect can not be.

AMMONII PROTOCYANIDI DICYANOFERRIS.

This substance also is commonly reckoned as Tonic; but in my opinion, without any foundation. Like the previously mentioned article, estimating a medium dose by the Cyanogen, seven grains of Iron are likewise required to be divided into twenty-six doses. In addition however to this, it contains Ammonium, a substance, which, in sufficient quantity always imparts more or less exhausting power to the compounds that contain it. But estimating a medium dose of this salt, by its Cyanogen, and four grains and a half of the Ammonium will be divided into twenty-six doses. If the small quantity of Iron modifies the operation of the Cyanogen in one way, the small quantity of Ammonium will be just as likely to modify it in an opposite way. I can not think therefore that these two last articles should be reckoned as at all Tonic. They would seem to be mere simple and pure Narcotics. But other gentlemen do not agree with me in this opinion. I put them here then with this broad caveat. Some facts with regard to the next group of articles, which I shall soon state, undoubtedly contribute to contravene my own opinions just given and to favor the opinions of those gentlemen, who believe that even these small doses are in reality operative.

TURMA QUINTA.

SUBANTIPHLOGISTICA SUBNEURAGICA.

POTASSII PROTOCYANIDUM.

SODII PROTOCYANIDUM.

CALCI PROTOCYANIDUM.

MAGNESII PROTOCYANIDUM.

I have never used the first two of this group of articles for any considerable length of time, nor have I ever known an instance of their use under the direction of other physicians, in which they did not impair the tone of the organs of primary digestion, manifested by diminution of appetite and impairment of digestive

power, before long accompanied with a sensation of weight or load referred to the stomach immediately after eating, but sooner or later felt the whole time, occasionally accompanied with much flatus and some times with excess of Acidity. Whenever I have learned that a physician is accustomed to prescribing the Protocyanid of Potassium, to be used for any length of time, I have been in the habit of inquiring for these symptoms and effects, and I have uniformly been informed that a greater or less amount of them is liable to be produced; but strange to be told, they have always been attributed to the Cyanogen, and never to the Potassium of the compound. Now I very well know that mere Cyanogen contributes to relieve these very symptoms, when produced by other preparations of Potassium, almost if not all of which will occasion these very effects. Now in Protocyanid of Potassium, estimating the doses by the amount of Cyanogen, every seven doses of the Cyanogen is accompanied by two and a half grains only of Potassium; so small a quantity, it is true, that independent of observation and experience, I should not think that it could possibly produce any effect whatever. The effects of such a small quantity of Potassium in this compound, contributes to prove that the Iron in the Dicyanoferrite of Protocyanid of Hydrogen, and that both the Iron and the Ammonium in the Dicyanoferrite of Protocyanid of Ammonium, small as their quantities are, may nevertheless prove operative, and accomplish considerable.

T U R M A S E X T A .

SUBANTIPHLOGISTICA ? SUBNEURAGICA SUBTONICA ?

POTASSII PROTOCYANIDI DICYANOFERRIS.

SODII PROTOCYANIDI DICYANOFERRIS.

CALCHII PROTOCYANIDI DICYANOFERRIS.

MAGNESSII PROTOCYANIDI DICYANOFERRIS.

POTASSII PROTOCYANIDI TRICYANOFERRIS.

It will be observed that in the specification of the powers of the group that immediately precedes, two opposing and medicinally incompatible powers are set-down, both with a note of interrogation. This is done to invite the positive and thorough investigation.

tion which it has never been convenient for me to make; and yet by means of analogy, I have arrived at conclusions in which I feel strong confidence, at least in relation to the question whether these agents are exhausting or Tonic. A considerable number of years ago, and before the first article had ever been mentioned by any author in connexion with the *materia medica*; and indeed before its true composition was correctly known, and while it was called Prussiate of Iron and Potassa, in connexion with three or four young men, I undertook to investigate the powers of this Salt. It so happened (as in numerous other similar cases) that I was called-away at the very beginning of the experiments, and was unable to take any further cognizance of them. The young men however took a single dose a day, for several days, each dose being successively larger, till (as they supposed) they obtained unequivocal Narcotic effects. For this effect they supposed that a quantity of the salt was necessary, which contained much more than an ordinary dose of the Cyanogen in a separate state. They arrived at nothing beyond this, and indeed might have been entirely mistaken in their conclusions. As the subject however was not pursued to my satisfaction, and as I then intended to resume it before long, I made no record of the observations of the young men.

For many years I have been in the habit of using the first mentioned Salt of this group, as a gargle in certain *Isthmitides*, and as a *Lotion* in certain *Stomatides*, as I think with great benefit and advantage. I have always enforced care that no material amount of it should be swallowed. I have likewise used it with much benefit and advantage in certain *Ophthalmitides*, and in certain cutaneous diseases in the form of *Lotion*. Since that time other articles, as subjects of investigation, have always seemed to deserve the preference; and so the matter remains with me, just where these young men left it. I have always considered it as producing too much Antirritant effect to be due to any thing but a Narcotic power; but in this I may have been mistaken. As it would be so easy to determine whether it is Narcotic or not, I regret much that the question has not been settled long before this; but when I have thought of the subject, I have had no leisure to attend to it. Gr. 2.673 of this Salt, contain one grain of Cyanogen. Now from a quarter to half a grain of Cyanogen is

usually a medium dose of this compound radical. I do not believe that a quantity containing this amount of Cyanogen would be operative as a Narcotic, and consequently the power of the Cyanogen must be more or less diminished in this agent, even if it is Narcotic at all. I can not doubt however that by sufficiently protracted use, it would certainly prove more or less exhausting in defiance of the little Iron it contains, since in all other cases within my knowledge, in which, in a chymical compound Potassium or Sodium are associasied with Iron, the exhausting effect of the former two, always transcends what little Tonic power the Iron might otherwise have exerted; and I doubt not that this is the fact with all the articles of this group, though I have suffixed a note of interrogation to the term Subantiphlogistic, and also to the term Subtonic, as applied to the intire group. I believe I may say confidently that every Salt containing Potassium or Sodium in conjunction with Iron, is always more or less exhausting, and never Tonic. I ought not to omit the statement in this place, that all medicinal power whatever, and more especially a Narcotic power, has been denied to the first article of this group, and of consequence to the rest of it. If the first article is inert the rest must certainly be so likewise. It is proper to say here also that, though I have long been in the habit of using the first article of this group a great deal, in a limited number of cases, yet I have investigated it less thoroughly than any agent whatever, that I have used so much.

TURMA SEPTIMA.

NEURAGICA ADENAGICA.

{ ACIDUM CYANAURICUM.
 { *Auri Proto?cyanidum.*

TURMA OCTAVA.

NEURAGICA SUB?EMETICA.

ZINCI PROTOCYANIDUM.

TURMA NONA.

SUBANTIPHLOGISTICA NEURAGICA
ADENAGICA.

POTASSII PROTOCYANIDI CYANAURAS.

SODII PROTOCYANIDI CYANAURAS.

POTASSII PROTOCYANIDI CYANOHYDRARGYRAS.

SODII PROTOCYANIDI CYANOHYDRARGYRAS.

TURMA DECIMA.

NEURAGICA ORÆSTHETICA ADENAGICA.

CYANOGENII DEUTOCHLORIDUM.

CYANOGENII PROTOBROMIDUM.

CYANOGENII PROTIODIDUM.

CYANOGENII DEUTOSULPHIDUM.

CYANOGENII DISULPHIDUM.

ACIDUM CYANOHYDRARGYRICUM.

HYDRARGYRI PROTOXDI SESQUICYANOHYDRARGYRAS.

Under ordinary circumstances, enough of the last two articles, and more especially the last, is not given to produce any Narcotic effects. A little more than a fifth of the Cyanohydrargyric Acid is Cyanogen, and if the power of the Cyanogen is not diminished in this compound, a grain and a quarter, or two grains and a half ought to be an operative dose as respects the Cyanogen. But I strongly suspect that the power of the Cyanogen is diminished, though I do not know how much. As appears to me the dose of the Cyanohydrargyric Acid can not well be greater than the dose of Chlorohydrargyric Acid, or Corrosive Sublimate of Mercury.

TURMA UNDECIMA.

NEURAGICA TONICA ADENAGICA.

BARYTI PROTOCYANIDUM.

BARYTI PROTOCYANIDI DICYANOFERRIS.

TURMA DUODECIMA.

NEURAGICA ORRÆSTHETICA EMETICA.

CUPEI PROTOCYANIDUM.

CUPRI DICYANIDUM.

TURMA DECIMA-TERTIA.

ERETHISTICA EUPHRÆNICA ANTISBESTICA
DIAPHORETICA.

It is not quite clear whether the following compounds should be ranked with the chiminal-inorganic Narcotics or not; but as Cyanogen is never found in any living plant or animal, but is always the product of factitious chiminal changes in dead vegetable or animal substances; and as its compounds with Morphinum and with Iron are even still more factitious, I have concluded to arrange them in this section, though perhaps the propriety of this arrangement may admit of question. If however the case is doubtful, it can not be of any material importance which situation is chosen.

MORPHINI PROTOCYANIDUM.

As Gr. 12.26 of Protocyanid of Morphinum contains only Gr. 1 of Cyanogen, it would be necessary to administer Gr. 3.06 of the compound (about eighteen common full doses of Morphinum for an adult of the customary susceptibility) in order to give a patient a moderate dose of Cyanogen. I think that the faith of a homeopathist in regard to small doses, must be necessary for a belief that the minute quantity of Cyanogen in a suitable dose of this compound, can possibly enhance the Narcotic effects of such an agent.

TURMA DECIMA-QUARTA.

ERETHISTICA EUPHRÆNICA ANTISBESTICA
SUBTONICA? DIAPHORETICA.

MORPHINI CYANIDI DICYANOFERRIS.

As Gr. 8.84 of Dicyanoferrite of Cyanid of Morphinum contains only Gr. 1 of Cyanogen, it would be necessary to administer Gr. 2.21 (about twelve common full doses of Morphinum for an adult of the customary susceptibility) in order to give a patient a moderate dose of Cyanogen. Although here there is only two-thirds as much of the Morphinum in proportion to the Cyanogen, yet still (as appears to me) there is too little of the latter in a dose of the former, to enhance its effects appreciably. As to the minute quantity of Iron that is contained in a suitable dose of this compound, I imagine that not much importance can possibly be attached to it, by any practitioner of medicine except a thorough homeopathist. For myself I have always believed that there is good reason for the question that I have often heard discussed, viz. has mere Iron any medicinal powers at all? I have always been more or less in the habit of prescribing it ever since I began the practice of medicine, and I must confess that the conviction of its inertness has been steadily growing upon me. But in another and more appropriate place I shall consider this question, and perhaps shall explain the reasons for my long employment of it. It is thought by some however that the Cyanogen modifies the operation and effects of the Morphinum, in some manner or degree, in both of these compounds—more of course in the latter than in the former; and the Iron is supposed to do the same with both the Morphinum and the Cyanogen of the latter compound. This modifying operation appears to be more probable from the Cyanogen than from the Iron.

Very nearly every individual of the class Narcotics, though having all the characters necessary to constitute it a Narcotic, must however be considered as producing peculiar and specific effects, in comparison with other articles of the class, not only upon the brain and nerves generally, but upon all the other subordinate parts of the system, which they may happen to affect, so that scarcely any two articles, however strictly and exclusively they may correspond with the definition, can be advantageously employed as perfect substitutes for each other. For example, it is commonly said that Cyanid of Hydrogen and Benzhylid of Hydrogen are exactly alike in their power, operation and effect. Indeed the two articles were long confounded, being constantly mistaken for each other, for a long period of time. And yet by per-

sonal experience and by much testimony of patients, they differ very materially, both in external sensible properties and in the sensations which they produce in the patient. The pure or undiluted articles also differ in their medicinal dose, and in the quantity adequate to destroy life. In the present state of my knowledge however, I should find it difficult to describe the peculiarities of each, in comparison with the other, so as to be perfectly intelligible on all points, though perhaps this might possibly be done, with a much more thorough and accurate knowledge of them than I now possess.

Again it would be difficult for me to state, in precise terms, the peculiarities of *Gelsemium nitidum* and *Amianthium Muscitoricum*, in comparison with each other; though I have had a patient detect the change of one for the other, from a single dose, and this not by their external sensible properties; for in the form of Tincture, in which they were employed, the patient avowed himself unable to distinguish either by taste smell or vision. The same might be said of much the greatest portion of the whole class. Different species of the same genus, which doubtless depend for their activity upon the same identical active principle, do not however fall within the scope of these remarks. For example, there are several active species of the genus *Datura*, which I am well satisfied, differ in no respect whatever, unless possibly in the mere degree of their activity, and only from containing a different amount of the active principle. The same I believe is true of several species of *Spigelia*; and I presume also of several species of *Digitalis*. These and other similar facts produce a necessity of treating of the different individual Narcotics distinct from each other, with only a small number of such exceptions as I have just specified.

A few articles have some times been recommended as almost identical in their effects, though not as quite so. For example, *Hyoscyamus niger* has been represented as producing all the desirable or beneficial effects of *Papaver*, with none of the undesirable, inconvenient, or supposed morbid effects of that article. Now I have never been able to find such a close resemblance between these two agents. Both of them exert the characteristic operations that bring them into the class Narcotics, though these differ very materially in quality, and in such a manner and degree as

to be very easily pointed-out, and very definitely described, which I shall endeavor to show in the sequel.

There are very few Narcotics that by external topical application or even by application to the whole external surface of the body, are capable of affecting the system at large. A very few however are capable of doing this. It is well known that by external application, *Nicotiana Tabacum* is capable of affecting the whole system powerfully. I have repeatedly sponged the whole surface of the body with a strong Infusion of *Nicotiana Tabacum* without ever producing the least perceptible effect on the system at large. I have often applied Fomentations (i. e. cloths wet with a hot Infusion) of this article, also without any perceptible effect upon the system at large. Again I have not infrequently applied hot Cataplasms of this agent to various parts of the body, some times with considerable constitutional affection from a small Cataplasm, and some times with no constitutional affection from a large one. I believe however if the Cataplasm is sufficiently large, and if its application is continued long enough, a greater or less degree of constitutional affection will always be produced, and occasionally a very intense one. When there begins to be too much effect, the removal of the Cataplasm and a thorough washing of the part to which it has been applied, will prevent any further increase of it; and it may be obviated with greater or less speed by the administration of *Spiritus Vini Gallicus* aided by Tincture of *Capsicum*, Tincture of Grains of Paradise, etc.

As tremendously active as a minute quantity of a good preparation of *Strychnos toxifera* is by inoculation, it is said that no amount of it applied to the sound skin will affect the system at large. What is true of this article, is supposed to be true likewise of *Rouhamon Gujanense* and *Rouhamon Curare*. I know of no good evidence that by external topical application, the Protoxyanid of Hydrogen (usually reckoned an Acid, viz. Cyanohydric) is capable of affecting the system at large, provided a dangerous quantity of it is not inhaled. There are plenty of tales to the effect that it is absolutely deadly when thus applied, but several of these have been proved to be without foundation, and it is probable that the whole are so. On the other hand I have known it extensively applied in cutaneous diseases without any constitutional effects at all. In all such cases, I have known it first applied to

a small surface, then to a larger one, gradually increasing its extent till it was applied to half the surface of the body, care being taken that it was not inhaled to any material extent. Under such an application I never witnessed the slightest operation upon the system at large.

I should suppose a priori that *Atropa lethalis* might be sufficiently active to affect the system at large, by external topical application; and yet I have never witnessed any such effect, though I have often used this article in this manner; and I have never had opportunity to converse with any physician who has witnessed it. If *Atropa lethalis* will not affect the system at large, applied in this way, I should not expect that any species of *Datura* would do so; and for myself, I never witnessed any constitutional effects from any topical application that I ever had opportunity and occasion to make; and I have applied it to more than half of the surface in extensive Causis, happening in Distilleries, and in connexion with the blowing-up of Gun-Powder Manufactories. On inquiring of other physicians whether they have ever witnessed any constitutional effects from the topical application of *Datura*, I have often been answered in the affirmative; but investigation resulted in the admission that it did not produce the slightest degree of dilatation of the pupils, the least trace of the peculiar Erethism or Sub-delirium, nor any other specific operative effect of this genus of plants.

I have never witnessed the slightest effect upon the system at large, from the external topical application of *Papaver*; though I think I have often known a local Antirritant and anodyne operation from it.

It is a prevalent popular opinion, and consequently it is the opinion of very many physicians, that Narcotics generally, and much more especially *Papaver* do not remove or obviate any morbid condition or any specific disease, whether of sensation or of action, or of both in conjunction; but that they only "stupify the senses" so that the morbid condition or the specific disease, whether of sensation or of action, is merely not perceived for the time being i. e. while the patient is under the influence of the Narcotic, more especially if it is *Papaver*; and that, when the Narcotic effects pass-by the patient is just where he would have been if no Narcotic had been taken, and therefore the Narcotics can

never be radical remedies for any thing, but are mere temporizing agents, that is placebos, or palliatives at most. These views I have heard a hundred times literally from physicians, and many more times from non-medical persons. However, notwithstanding the wide prevalence of such views and notions, I am well satisfied that Narcotics in general and Papaver in particular, are as often radical remedies, and positively cure as many diseases as any remedies in the *materia medica*. But I believe it is true that those who entertain these opinions seldom if ever cure any disease with these agents, since they do not appear to understand their proper management, viz. that which is necessary to make them radical remedies.

It is a widely prevalent opinion, not only among non-medical persons, but also among physicians, that Narcotics are not safe medicines. This opinion I have heard strenuously maintained and pertinaciously defended both by physicians and their employers. In fact I have heard it *ex cathedra*, in a medical college, and I have met with it often in works on the *materia medica*. Of course I have often encountered the same objection at the bedside, not only from the patient, but from physicians that I have had as counsellors, or with whom I have been called in consultation. Whenever I have inquired for the grounds of apprehension in regard to the use of Narcotics, they have always proved to be exceedingly vague and shadowy, and have never rested upon any specific, definite or precise fact; though I have often thought that such apprehensions are always much more pertinaciously maintained and retained than any other. But notwithstanding all this, I doubt whether there is any other active class of medicines, that are more safe in their immediate operation, or less liable to produce remote ill effects, whether slow gradual and insidious, or sudden and prominent. Even when they are taken at once in such quantities as to produce a degree of their ultimate effects, never needed for the relief of disease, nothing but present inconvenience ever results, no remote consequences at all injurious ever taking place.

Among many physicians within my knowledge, the great ground of apprehension in regard to the Narcotics has been that they would injure the brain. I have not infrequently had a counsellor who absolutely shuddered at the amount of Papaver that I hap-

pened to be giving for the restraint of a very urgent Diarrhœa that accompanied what would have been a very dangerous case of Typhus nervosus even without the Diarrhœa, and this when the patient did not sleep as much as natural, and when without any information I do not think that the counsellor would have guessed that the patient was taking a particle of this agent. On inquiring what possible objection there could be to such a use of Papaver, the reply has been that "it would strain the brain," I suppose by means of the very great congestion, that it must produce in this viscus or organ.

Some object vehemently to the use of Narcotics because they operate upon the brain even in any manner or degree. The brain say they, is the organ by means of which the mental or intellectual operations are performed. As is supposed, it can not therefore be a legitimate subject of medical treatment. I could never however see why. This viscus is certainly subject to Phlogosis, to Paralysis, to Acinesia, to Lethargus, and a multitude of other diseases which affect other viscera; and why should it not require analogous or similar treatment. Now an operation upon the brain, and the nervous system generally, in addition to the brain, is the very point that gives this class all its value. What would a Narcotic be that did not operate upon the brain and nerves. If we had no remedies that operated upon the brain and nerves, how should we treat the diseases of this subordinate and altogether the most important part of the animal economy. But it is alleged that we need nothing to act upon the brain and nervous system after the manner of the Narcotics. But how can this be shown? Are there not some times morbid irritability and irritation of the brain? Are there not some times morbid sensibility, morbid sensation and pain in the brain? Is there not some times morbid wakefulness, a condition seated exclusively in the brain? Are not these symptoms some times perfectly idiopathic? Are they not some times symptomatic of various atonic diseases? Now what have we beside Narcotics that is capable of relieving these symptoms in either of the cases supposed? As appears to me, there is absolute necessity for Narcotics in these circumstances; and if they were used in no other cases, they would merit to be considered as among the most important classes in the whole *materia medica*. But the number of diseases, that have their seat in the

nervous system solely and exclusively, and not in the organs to which the nerves are sent, is very great, much more so than is commonly supposed. Dr. Good certainly has not mentioned more than two thirds of them, and perhaps not more than half, in his large class *Neurotica*. Now the *Narcotics* are the appropriate remedies, and often the only ones, for by far the greatest proportion of all these maladies; and I consider it as quite certain that very many of them can be successfully, or even judiciously treated, by nothing else.

A practitioner of medicine not well acquainted with the *Narcotics* and their best modes of management, is very far short of being master of his profession; and in strict propriety, is unfit to take charge of, and prescribe for the diseases of the present period, almost all of which involve the nervous system to a greater or less extent, and many of which are intirely confined to it. If medical gentlemen would study the powers operations and effects of the *Narcotics*, as well as their proper management, and understand both far better, they would have far less timidity in their use.

I shall conclude my remarks upon the *Narcotics* with John Murray's catalogue of the class.

1. ALCOHOL.
2. ÆTHER.
3. CAMPHOR.
4. PAPAVER SOMNIFERUM.
5. HYOSCYAMUS NIGER.
6. ATROPA BELLA-DONNA.
7. ACONITUM NAPELLUS.
8. CONIUM MACULATUM.
9. DIGITALIS PURPUREA.
10. NICOTIANA TABACUM.
11. LACTUCA VIROSA.
12. LACTUCA SATIVA.
13. DATURA STRAMONIUM.
14. RHODODENDRON CHRYSANTHUM.
15. RHUS TOXICODENDRON.
16. ARNICA MONTANA.
17. HUMULUS LUPULUS.
18. STRYCHNOS NUX-VOMICA.
19. PRUNUS LAURO-CERASUS.

Murray's first article possesses at least five other powers beside its Narcotic power, and so far as I know, is never used for the last. His second article, in my opinion, possesses no Narcotic power whatever; but it possesses at least three intirely different and distinct powers. His third article is in all probability truly Narcotic; but it possesses at least four other different and distinct powers. His fourth article is one of the most valuable Narcotics in the materia medica, both in the quality and the amount of its Narcotic power; but it possesses four other powers in addition, His fifth article is a simple and pure Narcotic, without any other power in conjunction. His sixth article is perhaps a simple and pure Narcotic, and perhaps it possesses a single other power in addition. I do not consider that Murray's seventh article is Narcotic at all; but whether it is or not, it certainly possesses one other different and distinct power. His eighth article is Narcotic, with one and perhaps two other powers in addition. His ninth article is Narcotic, with a single power in addition. His tenth article is Narcotic, with at least four other different and distinct powers in addition, for one of which latter powers it is used almost exclusively. I say that this article possesses these powers, though I am not sure that it does, independent of a certain factitious preparation. His eleventh and twelfth articles I believe to be perfectly inert, for reasons that have already been given, and the proofs will be adduced hereafter. They are however claimed by some to possess the power which I am in the habit of calling adenagic. I have not examined them very thoroughly in reference to this, which hinders me from speaking very positively on this point. But this subject will be considered and discussed hereafter. His thirteenth article is perhaps a simple and pure Narcotic, and perhaps it possesses a single other power in addition. It seems to be exactly like one of the plants called in Italian, Handsome Lady (*Bella-Donna*) except that it is weaker. It may also be like *Amaryllis Bella-Donna* for aught I know, since that article is Narcotic. His fourteenth article may or may not be Narcotic in a moderate degree; though I am strongly inclined to think that it is not; but I do not happen to know enough of it, to be able to decide the question to my own satisfaction. At all events, it possesses two other powers, from the effects of one of which mainly, it is my belief

that it has acquired the reputation of being Narcotic. His fifteenth article is utterly and intirely destitute of any Narcotic power, as much so as *Cantharis vesicatoria*, *Sinapis alba*, *Capsicum annum*, etc. It possesses three intirely different and distinct powers, and is analogous to *Cantharis vesicatoria* in all its operations and effects, except merely the manner in which it blisters the skin. I consider it as absolutely certain that Murray's sixteenth article is perfectly destitute of any degree of Narcotic power; but it possesses one or two other powers quite different and distinct. His seventeenth article I have repeatedly experimented with, and as I think, proved that it is no more Narcotic than *Gentiana lutea*, *Cocculus palmatus* (Kalumb) or any other simple tonic. I think however it possesses a slight degree of one other power besides that of a simple better tonic. His eighteenth article I do not reckon as at all Narcotic. It does not appear to me to have any of the characters required by the definition. In reality its operations and effects are quite opposite to, and incompatible with those of a Narcotic. Murray's nineteenth article has been ranked with the Narcotics from the hypothesis that it contains Prussic Acid so called, a name (as I have already said) that has been applied to six different and distinct compounds. Now there is absolute proof that the article in question contains neither of these compounds; and I have no knowledge that it has ever been suspected of containing any other Narcotic principle. It is easy to exalt an inert article into an active and formidable poison by a hypothesis, but it is not so easy to depose it again. This article however is not exactly inert, since its bark, and perhaps its leaves, are moderate simple bitter-Tonics.

For myself I have never been able to discover much philosophy in Murray's arrangement of the articles, which he refers to his class of Narcotics. Now I might criticise what Murray says of this class as an aggregate, as well as what he says of each individual article, and I should find it just about as correct as his catalogue of articles belonging to the class and as his arrangement of the articles among themselves. If Murray had taken "*haud ego vates*" as his motto, I do not think that any of his readers would ever have paused to controvert its propriety. And yet, Murray's book was the standard work on the *materia medica* for very many years in our country, was the text-book of most of our instruction

on its subject, and in fact had immense influence upon the use of medicines and the practice of medicine generally, at least with us in New England, from the time of its publication about 1806, earlier or later, till the publication of Pereira's work, i. e. about forty years longer or shorter.

As appears to me the great body of physicians know less of the true powers and operations of the Narcotics, and of the proper modes of managing them, than of any other class of remedies; and in general they are more afraid of employing them than of any thing else.

PROËM TO THE CLASS ERETHISTICA.

The terms Erethistica and Erethism are both ancient Greek. Beside these, there are three other very nearly related terms, all derived from a radical verb commonly translated *irrito*; *laccio*, i. e. to irritate; to provoke.

Definition. Erethistica or Erethistics are articles which produce a preternatural degree of activity, and an augmented exertion of the powers and energies, by which any function is discharged. A mere and pure Erithistic agent may indeed be compared to the whip and the spur, which do not give any new and additional power or energy, but only bring into greater activity that which already exists, which was not previously exerted, at least to the same extent, and which perhaps was latent or prostrated in a greater or less degree. This as a bare definition is applicable only to all mere and pure Erethistic articles. It is not by any means true of Antisbestics and Tonics, as is so often alleged. As in many other cases, the quality of the action constituting an Erethistic operation or effect is perhaps essential, but this can not be reduced to words, and therefore can not enter into the definition. A very accurately observant physician will however soon learn to appreciate this and be able to make it quite available in the selection of his agents for the treatment of particular cases.

The preceding I consider as more appropriately the diagnostic definition of this class, but yet, all the most unequivocal and the most active of the Erethistics, when pushed to a certain extent, produce likewise what is called stupor or numbness in some part of the system, which is made-up of an aggregate of effects to be subsequently specified. The most active then, if not the whole of the Erethistics produce certain other symptoms or operative effects, the observation of which is quite important for determining when the system is properly under their influence. These other symptoms or operative effects have their seat mainly in the nerves of common sensation, and as produced by certain individual articles, they consist in a feeling of tingling, prickling, formication and numbness, sometimes but not generally, with a feeling of heat, all commonly beginning in the lower extremities, next extending to the upper, and occasionally pervading even the whole trunk. These sensations, when in any degree intense, are usually accompanied with imperfect obedience of the muscles of voluntary motion to the influence of the will. In short, the state of a limb when it is said to be "asleep" is almost a fac simile of the condition that I am describing. This whole state is exactly what was implied by the term stupor in the Latin language. This term it is true, has now got a secondary and derived signification in the English language considerably different from that which is here given; but very often among medical writers, even of the present period, this term is used exclusively in its true original and etymological acceptation, and much more among the older writers. But there is another sort of imperfect obedience of the muscles of voluntary motion to the influence of the will, produced by these agents which causes the patient unconsciously to walk with a staggering gait exactly as if inebriated in a moderate degree. Several of my patients who were taking, by my advice and direction, either *Ignatia amara* or *Strychnos Nux-vomica* have acquired the reputation of inebriants—a reputation of which, in these days of intemperate temperance, they have never since been able to free themselves, in consequence of walking the streets while under a comparatively full influence of one or the other of these articles.

As stupor, particularly of the lower extremities is such an important diagnostic of that operation and of those effects which

I denominate Erethistic, the term requires a more detailed definition in this place; and as none can be less equivocal than that of Francois Boissier de Sauvages, though it contains some repetitions I shall quote the definition of that distinguished Nosologist. "Stupor est singularis et molesta sensatio cum obsecritate tactus, quam excitat contusio olecranii, aliarumque partium per quas nervi majusculi sub cute transeunt; quam quisque experitur cum olecranii aut nervi fortis pressio facta est; aut cum diutius horis pomeridianis brachio incubuimus; quam experiuntur artus diu compressi vel proprio vel alieno pondere et situ non mutato." "Dolor sit qualis a millenis Formicis seu spiculis partem stupidam pungentibus." (*Pg. 24ta Col. 1ma. Tom. 2do. Nosol. Method. Francisc. Boissier. Sauvages. Venetiis, 1773.*) Though I do not think that this definition can be literally translated without loss of force, nevertheless I have attempted to give it in English in the synopsis of the classification on page 410 of this work.

Swedeaur defines Erethismus as meaning "irritabilitatem fibrarum musculariarum morbosam" (*F. Swed. Mat. Med. Parisiis An. 8. Pg. 465.*) This is very certainly erroneous. Nothing can be wider or more remote from my understanding of this term, or from the sense in which I employ it.

Several of the powers of the materia medica have a stage or grade of operation that may very properly be called Erethistic; but the Erethism, as produced by different powers is always peculiar, and in fact specific, as much so as the power itself; though these several Erethisms notwithstanding all their peculiarities, still have in common all that is necessary to constitute them Erethisms. But as Erethisms they are quite an unimportant and by no means a prominent part of the whole operations and effects of the powers which produce them respectively. A very considerable number of articles belonging to other classes therefore, have the power of producing a peculiar Erethism of their own; but this, as I have just intimated, is always quite a subordinate part of their operation—a part which takes place only under certain management, and even then only in a comparatively moderate degree, and possesses such peculiarities as to indicate very clearly that it is a grade of some other operation.

There are however several groups of articles whose principal or even sole operation is the production of an Erethism—an Ere-

thism far more prominent and distinct than the slight and peculiar operation to which I have just alluded. The Erethism produced by the articles truly and properly belonging to this class is always very obviously primary—is the most prominent and peculiar, if not the sole effect of the agent, and is too distinct and unequivocal to be mistaken for a mere secondary or accidental grade of the operation of some other different and distinct power. The fact that the Erethism produced by these articles has been almost uniformly if not invariably confounded with Ultimate Narcosis, and yet not so confounded but that it has been deemed necessary to distinguish it from ordinary Narcosis by prefixing the epithet *acid*, is quite conclusive that it is not difficult to distinguish it from the secondary Erethisms of numerous other agents that prove Erethistic only by certain peculiar management, and only as an accidental grade of the operation of quite a different and distinct power.

I have not been in the habit of meeting with true and genuine stupor of the extremities from pure Narcotics, i. e. Narcotics in contradistinction from Erethistics, such as *Strychnos* *Nux-vomica*, etc. It is probable that this symptom never accompanies an intense degree of true and proper Narcotic power; or, in other words, that the degree of Erethistic effect produced by certain decided and unequivocal Narcotics never amounts to so high a grade as to constitute stupor of the extremities. I once had a patient who complained of a troublesome degree of this symptom in the lower extremities from *Conium maculatum*, [accompanied with what the patient called swimming of the head. She said she felt as if she could not walk across the floor without staggering; and yet as a matter of fact, she could walk as well as ever. The power of producing stupor of the extremities, without the ordinary effects of true, proper and unequivocal Narcotics, is nevertheless quite a good diagnostic of a true and proper Erethistic.

It is a question whether the symptoms described in the secondary part of my definition are essential to this class of medicinal agents or not. Certainly the most active of the two great groups of the Erethistics, produce the effects in question, as for example, *Ignatia* and the five analogous *Strychni* on the one hand, and the *Aconita* on the other. In fact *Turnbull* in his *Monograph* of certain of the *Ranunculaceæ*, seems to suppose (erroneously without

doubt) that the production of these effects constitutes the whole peculiarity of this class of medicinal agents, and that it is by these effects merely that disease is cured. This writer of *Monographs in materia medica* (evidently in reference to an Erethistic power, though he gives it no name) says that "the properties alluded-to are those (when the articles are administered internally) of occasioning sensations of heat and tingling on the surface of the body, and of producing similar effects locally, when rubbed upon the skin, in most instances, without giving rise to" (any) "irritation of the vascular system, and when exhibited in either way, in certain painful diseases, as Neuralgia, Rheumatism," (qu? Rheumatalgia) "and Gout, of alleviating or removing the pain, apparently by producing a peculiar effect upon the nervous system" (which effect is unconnected with, and) "unattended by any narcotic influence." "These effects are more certain, and are occasioned with a higher degree of energy, by the active principles obtained" (in a separate state) "from the plants" (which possess this power) "and on this account, the author has bestowed more attention on them, and in most cases, would give them the preference, as medicinal agents." (*A. Turnbull M. D. on the Med. Prop. of Nat. Ord. Rannunculaceæ Lond. 1835 Preface Pg. 5 and 6.*)

Again the author just quoted says more definitely, and with rather more detail, that "when preparations of these articles, or these Alcaloids, are exhibited internally, in small and" (often) "repeated doses, they give rise to peculiar effects in the nervous system, but more particularly in the nerves of" (common) "sensation." "These" (effects) "consist of heat and tingling in the skin, beginning generally in the extremities, and extending themselves towards the trunk and head, and some times ending in sweat; and in Rheumatic" (qu? Rheumatalgic) "and other painful affections, these sensations being attended with marked relief to the patient." Our author adds "the same effects are produced, but more locally, when the active principles, and other" (concentrated) "preparations of the articles are applied by friction over the seat of the disease." "Heat and tingling are" (thus) "likewise produced,—at first only in the part where the friction has been made, but afterwards extending itself over the skin" generally. "In affections which are topical in their nature, these peculiar feelings

are also attended by great diminution in the severity of the symptoms, and often by a removal of them after other means have failed" (*Ibidem Introd. Pg. 3 and 4.*)

I am inclined to think however, in opposition to Dr. Turnbull, that there are genuine Erethistics, which are not yet known ever to produce the effects mentioned in the secondary part of my definition viz. a sensation of tingling, prickling, formication or numbness, occasionally with a sensation of heat, and commonly with imperfect obedience of the muscles of voluntary motion to the influence of the will; but possibly I may be mistaken. Would the power of producing the effects just specified, without the power of producing a preternatural degree of activity, and an augmented exertion of the energies by which any function is discharged, indicate a true and proper Erethistic or not? This is a question which I am unable to decide, to my own satisfaction, never having made a sufficient number of sufficiently accurate observations. In the present state of my knowledge, I am inclined to believe, that the power of producing one set of these effects never exists without the power of producing the other set in a greater or less degree; though I think it must be admitted that by different articles, they are producible only in very different proportions in relation to each other. I believe that some times the effects which make the primary part of my definition, are prominent, while those that make the secondary part are comparatively obscure; and vice versa, that those which make the secondary part of my definition are some times prominent, while those that make the primary part, are comparatively obscure. Now if such is really the fact, we should expect a priori that there might be articles, in which one or the other set of effects might be so much diminished as not to be easily appreciable, while the other set continued to be so prominent, as to be readily perceived. These, I suppose to be the true facts in the case.

There are many different qualities and degrees of what may be specifically called an Erethistic power, operation and effect, existing in various associations and combinations; but I do not now recollect any pure and mere Erethistic; and yet the other powers, that are so universally found in connexion with an Erethistic power, are so diverse and various as to preclude absolutely their being considered as different stages of an Erethistic operation or

effect. There are, however, as I have already said, a few other different and distinct powers, that might with propriety be considered as different specific Erethistic powers from that now under consideration. Foreexample, a Euphrenic power in all the stages or grades of its operation (except perhaps the last, viz. the anæsthetic and perhaps even this may not be excepted) may fairly be reckoned as a peculiar and specific Erethistic power; though of quite a different sort in quality from that now in question. Again, an Oresthetic power in all the stages or grades of its operation may also be fairly considered as a peculiar and specific Erethistic power, though likewise of quite a different sort or quality from that now in question. But though a Euphrenic and an Oresthetic power, in all their several stages, may be truly Erethistic powers generically; yet each, as heretofore stated, is peculiar, specific and sui generis in comparison with the other, and with the more eminently Erethistic articles to which I now have more especial reference; and each is now very properly the foundation of a class of medicinal agents; so that these facts constitute no sound objection to the establishment of another class, founded upon the different and more eminently Erethistic power possessed by the articles which I propose to comprise in the present class. I think also that there is an Erethistic stage of an Adenagic operation, which occurs under certain management of particular Adenagics; and perhaps the Neuralgic stage of a Neuragic operation may be considered as an Erethism of the function of common sensation; though in both of these cases, I may be mistaken in regard to the true nature and character of the effects to which I refer. I would expressly inculcate then, that there is a stage of the operation of other distinct classes of agents, that is truly Erethistic generically, though in a different specific manner from those that I think should be arranged in the medicinal class of Erethistica propria.

This power certainly produces no direct Antirritant effect whatever. It is indeed often indirectly Antirritant, to a considerable extent; and so is a Euphrenic, an Oresthetic, an Antisbestic and a Tonic power—each and all of them quite as much so as Ignatia and the five Erethistic Strychni.

This power, I think, produces no direct Anodyne effect whatever. It is often indirectly Anodyne to a considerable extent;

and so indeed is Cinchona, and various other articles belonging to very different classes.

This power never produces any direct [Soporific or Hypnotic effects ; but on the contrary, it very often occasions a decided and even prominent Agrypnic operation. The pure Erethistics then, are never directly sedative or stupefying, but often (not always) more or less arousing. A Narcotic operation then is certainly no part of the sort of Erethistic operation of which I am now treating. I know of no reason, however, why an article may not possess this power, and also a Narcotic power in conjunction ; though at present I can not recollect very many such examples. When Papaver is administered in uniform doses, at regular and very short intervals, the quantity taken in the twenty-four hours being more than the disease requires, and as much more as the patient can tolerate, without disagreeable Ultimate-Narcosis, a peculiar and specific Erethism is produced. The same Erethism some times takes place in subjects of very peculiar susceptibility, from a comparatively moderate quantity of Papaver,—a quantity in some instances even less than the disease actually requires. This as appears to me, is the peculiar and specific Erethistic power, which is the foundation of this class, superadded to the Narcotic and other different and distinct powers possessed by Papaver. Dr. Turnbull indeed supposes that the Aconita possess a Narcotic power in addition to the power of which I am now treating ; but on this point I think he is most assuredly mistaken. I have never been able to detect any thing like a Narcotic operation, in any of the Aconita, distinct from the operation to which I apply the term Erethistic. Atropa lethalis or Bella-Donna, and the several medicinal species of Datura, when managed in the same manner that I have specified in reference to Papaver, are capable of producing an Erethism sui generis, and which is peculiar to themselves, but which is perhaps only a stage of their specific Narcotic operation and effect, and perhaps it is the particular and specific Erethistic power, which is the foundation of this class, superadded to their Narcotic power. On the whole, I am inclined to think that the latter is the fact. Other analogous examples might doubtless be mentioned ; but these will suffice to illustrate my meaning.

It will at once be obvious, that the existence of an Erethistic

stage generically in the operation and effects of any power or powers upon which a class of medicinal agents is founded, or of an Erethistic stage generically in the operation and effects of any individual medicinal agent, can furnish no good objection to the foundation of a class Erethistica upon a different specific sort of Erethistic effect,—one which is within a stage of any other distinct operation, nor necessarily nor essentially connected or associated with any other different or distinct operation or effect whatever.

As is the fact in regard to the Antisbestics, so there are no perfectly pure and simple Erethistics; and yet, as the peculiar sort of Erethistic power which constitutes the foundation of this class, is not necessarily and essentially connected with any other power known or recognized in the *materia medica*, but is found associated with different and various powers, such a fact (as I have said) furnishes sufficient evidence that the power in question is different and distinct from every other power in the *materia medica*, and that it may with propriety be made the foundation of a class. As I have already said, I consider the peculiar quality of Erethistic power, on which this class is founded, as materially and essentially different from a Narcotic power, though I see no reason why this specific Erethistic power may not be associated with a Narcotic power. In fact I am convinced that Papaver does actually possess a certain degree of this specific Erethistic power which may easily be brought into operation by a certain mode of management, just specified. This Erethistic power of Papaver in my opinion is certainly different and distinct from its Narcotic power, and should certainly be mentioned as belonging to this article, though I am not apprised that we ever prescribe Papaver for the effects of this power, though we often get these effects when we prescribe it for other purposes. Erethistic and Narcotic powers then, are some times associated. When this is the fact, one of the powers usually predominates over the other.

These two powers may be distinguished by the following circumstances: . 1. Erethistics are never direct Antirritants. 2. They are never direct Anodynes. 3. They are never direct Somnifics or Soporifics, or in other words still, Hypnotics. 4. They produce but few of that aggregate of symptoms which in conjunction constitute decided and unequivocal Ultimate-Narcosis.

A Euphrenic power may doubtless be associated with an Erethestic power. It is quite important to distinguish the several parts of a Euphrenic operation from an Erethistic one. I have often known them confounded; and in the beginning of my own attempts to discriminate them, I had considerable difficulty; though now the subject has long been plain to me. I recollect having doubts whether certain effects of the several medicinal species of *Datura* were Euphrænia or Erethism. I now know them to be very certainly Erethism. These two powers may be readily distinguished by the following considerations: 1. Erethistics do not directly and immediately obviate languor and lassitude; though I never heard of a patient's complaining of either of these when under an unequivocal degree of Erethism. 2. They do not produce any degree of a calm, placid and pleasant sensation. 3. They some times produce a peculiar preternatural wakefulness; but it is widely different, both in its sensations and its external manifestations from that of the Euphrenics. 4. They do not produce any exhilaration like that of the Euphrenics, though they often render a person very talkative. 5. Not infrequently they produce a peculiar sort of delirium, very unlike that of the Euphrenics, which is merely excessive exhilaration intirely beyond the control of the will. 6. They do not produce any true and proper anæsthesia; but at an earlier stage of their operation, they produce stupor even very intense, more frequently in the lower extremities than elsewhere. 7. Some of the Erethistics when sufficiently active produce true and proper Tetanic Spasm, by means of which they destroy life; while the Euphrenics neither produce Tetanus, nor are they known ever to destroy life, at least by their Euphrenic power.

An Oresthetic and an Erethistic power may be associated. An Oresthetic power may be distinguished from an Erethistic power by the circumstances that the Oresthetics obviate torpor or insusceptibility or even positive irritation, without occasioning any preternatural activity or any augmented exertion of the existing powers or energies.

An Antisbestic power may be associated with an Erethistic power. An Erethistic power may be distinguished from an Antisbestic power by the circumstances that under the operation of the former, there is only a preternatural activity and an augment-

ed exertion of the powers and energies that previously existed; while in the latter, there is not only an increase of the vital energies, but also an increase of the strength of action. Erethism is not at all incompatible with extreme exhaustion, and it is not of the least service towards its obviation; while Antisbesis is remedial of exhaustion. Indeed Antisbestics and Tonics are the only true remedies for exhaustion. Antisbesis and tone are in fact incompatible with it; and if a sufficient amount of these can be established, exhaustion is at an end. It is by no means so with Erethism. Erethism often exists in articulo mortis.

A Tonic and an Erethistic power may be associated. A Tonic power may be distinguished from an Erethistic power in much the same manner as an Antisbestic power. Tone implies an increase of the vital energy and strength of action, as much as Antisbesis; though in the case of Tone it is always more or less slow, gradual and permanent; while in Antisbesis it is quickly diffused and more or less transient or fugitive. This is all the difference that can be made by definition; but in all probability there is a difference in quality that can not be reduced to words.

An Adenagic and an Erethistic power may be associated. A simple reference to the definitions will be all that the diagnosis requires between an Erethistic and an Adenagic power.

Some of the Erethistics are Ecboics. Is this a different and distinct power associated with an Erethistic power, or is it a peculiar succession of the legitimate operations and effects of a mere Erethistic power? The Erethistics, as heretofore stated when treating of Narcotics, sometimes produce Convulsions as a primary part of their operation when a sufficient quantity of the article is given; and sometimes only as a secondary part of their operation. Again the Erethistics like the Narcotics perhaps sometimes produce Convulsions through nerves of involuntary motion before they produce them through nerves of voluntary motion, and even in the uterus before any other involuntary organ. When an Erethistic produces Convulsive action and of the common or subtonic sort, and as a primary part of its operation, and in the involuntary muscles instead of the voluntary, or in other words, in the involuntary before it affects the voluntary, and in the uterus in preference to any other involuntary muscle, it is my present belief that it will always be found an Ecboic. The same, I think, is equally

true of the Narcotics. Are there any Ecbolics that are not either Narcotics or Erethistics? If there are not, I shall be inclined to think that the preceding statement contains the rationale of an Ecbotic operation. If it appears that there are Ecbolics which are neither Narcotics nor Erethistics, the next inquiry will be, are there any which are incapable of producing Convulsive action. If there are Ecbolics that are incapable of producing Convulsive action, then I shall be induced to believe that an Ecbotic power is doubtless a peculiar and distinct power, different from any other power on which I have founded a class. Producing Convulsions under such circumstances we might expect a priori to find Ecbolics among the Erethistics, at least if my views in regard to the Ecbolics are correct, and, accordingly one Ecbotic at least is known among them viz. Botrophis Actæoides; and, in all probability more will yet be discovered. An Ecbotic operation seems very much like a Convulsive action of the uterus and I know not why, Convulsion, which is almost always morbid, may not some times be subservient to the performance of a natural function.

The Erethistics then, like the Narcotics, have the power of producing Convulsive action, and that of more than one sort, usually but not always, as a part of their ultimate operation, i.e. their operation beyond a medicinal grade. Under the Narcotics I have denied (or I should have done so) that there are any now known which produce that sort of tonic spasms properly called Tetanic; though there are many which produce that sort of tonic spasms called common, as those of Entasia Convulsio or Common Convulsion. Are not all articles that produce Tetanic spasms, Erethistics? I think they are. If Ignatia amara, Strychnos Nuxvomica and the four other Strychni (and perhaps more) that possess similar powers, together with the several species of Coriaria are removed from the class of Narcotics, I am not aware that any article remains in it that produces true and proper Tetanic Spasms. Let it be observed that I do not say tonic Spasms, since Spasms may be tonic without being Tetanic. I consider both Common Convulsion and Hysteric Convulsion as tonic Spasms, but not as Tetanic, though the latter some times counterfeits Tetanus almost exactly. It is however true that the Spasms of Common Convulsion and Hysteric Convulsion are only a more moderate grade

of the Spasms of Tetanus and Lyssa, but they are not identical. The latter are Tetanic but not the former, though both are tonic. I have very often heard Epilepsy called tonic and even Tetanic Spasm, because the body is stiff and rigid during the Fit; but this is a great error. It is often the fact that Tetanic Spasms are attributed to some unequivocal Narcotics, as I think by mistake—articles which in fact produce only clonic Spasms like those of Sympasie Epilepsia. For example it is frequently said that *Cicuta maculata* produces not merely tonic Spasms, but even Tetanic ones; and yet I have never seen any Spasms from it, except exquisitely clonic ones, as much so as pure Epilepsy; and I have repeatedly seen the ultimate effects of this agent. Again, it is sometimes said the *Conium maculatum* produces tonic and even Tetanic Spasms. I never had opportunity to witness such Spasms from this article, but I have had the testimony of those who had, and perfect clonic Spasms have always been described. The describer however has always been inclined to consider the general rigidity that always makes a part of an Epileptic Fit as indicative of tonic and even Tetanic Spasms. A priori I should have thought this article quite as likely to produce Tonic Spasms of the common sort, as any other.

It has seldom been the fact that those physicians that I have met at the bedside of patients affected with Spasms, have had any correct notions of the difference between clonic and tonic Spasms. Also when I have been consulted in private, by physicians in regard to patients affected with Spasms, it has been very rare that they could tell me whether they were clonic, or tonic, or of some other sort. This seems to be owing to the great influence exerted by the views and opinions of the late Dr. Benjamin Rush, in consequence of which the similarities and dissimilarities, together with the classification, and of course the exact diagnosis of disease has been undervalued, slighted and neglected, or at least very little studied by very many members of the medical profession since the time that Dr. Rush exerted his greatest influence.

Do not all medicinal agents that produce Tetanic Spasms, always produce them only through the medium of nerves of voluntary motion? Tetanic Spasms may certainly be produced through the medium of the involuntary nerves of expression, though not by medicines; but such Spasms, through the medium of the

whole of the nerves, constitute Entasia Lyssa or Rabies. Now I do not think that there is any medicinal agent known, that is capable of producing this disease. If there were it would most likely be by virtue of an Erethistic power. There are doubtless Erethistics that produce Tonic Spasms which are not Tetanic. I think, nay I am sure that this is the sort of Spasms that are produced by the medicinal species of Cimicifuga, Botrophis and Actæa; and doubtless there are other Erethistics producing the same sort of Spasms.

I do not certainly know that all the Erethistics are capable of producing Spasms of some sort or other; though as the most prominent articles of the class do it, such a fact furnishes a presumption that the whole are capable of doing it, when sufficiently concentrated and taken in sufficient quantity. I may however have enumerated some articles under this class that do not truly belong here, since I am not equally well acquainted with every article mentioned. In fact I entertain some doubts whether some of my last groups truly belong here, though I believe that they do. If there are any articles specified that are not true Erethistics, such articles may be incapable of producing any sort of Spasms. As our best information now is, some Erethistics produce that sort of tonic Spasms that occur in Tetanus and Lyssa, while others produce that sort of tonic Spasms that occur in Entasia Convulsio or Common Convulsion and Entasia Hysteria or Hysteric Convulsion. It is altogether probable that another set of Erethistics produce that sort of clonic spasms, that occur in Sypasias Epilepsia, but this I do not certainly know. Whether there are any Erethistics that produce true and proper clonic Spasms, and especially such as those of Epilepsy, I am not quite sure; but I suspect that the several species of Aconitum and the rest of the turma or group to which it belongs, may do this. I do not certainly know it however; and it is clear that suspicion and probability should never pass for knowledge. From their analogy, indeed similarity to the Aconita, I doubt not that if Arnica and Doronicum produce any Spasms at all, they must produce the clonic sort. This opinion is founded on the facts that their sensible and occult properties are so near like those of the Aconita, and that they appear to destroy life in much the same manner that those Narcotics do, which produce clonic Spasms. I never saw

any Spasms from the medicinal Wrightiæ; but from the manner in which they destroy life it is most probable that they produce clonic spasms, if they produce any at all. I do not think that they would be likely to be analogous to a great section of the Narcotics in one of these respects, without being so in the other. I think I have seen something like clonic Spasms produced in Sheep by the Rhododendreæ. If these articles produce such Spasms in brute animals, they will be most likely to produce them in man. Besides this however, they destroy life after the manner of those Narcotics that produce clonic Spasms. From the natural history affinities of the Ledææ, the Andromedææ and the Arbutææ with the Rhododendreæ under a deficiency of positive knowledge, we might be allowed to suppose that if they produce any Spasms at all, they will be of the same sort as those produced by the Rhododendreæ. But there is but one objection to this view of the Arbutææ, viz. the reputed Ecboic power of *Arctostaphylos Uva-Ursi*. In analogy with the Ecboic Actææ, this article ought to produce the common variety of tonic Spasms, and then it will be necessary to inquire whether the Andromedææ, the Ledææ and perhaps even the Rhododendreæ do not do the same. In reality there is no substitute for actual and positive knowledge. If the Anemoneæ, the Clematideæ and the Daphnaceæ, produce Spasms or Convulsions of any sort, I strongly suspect they must produce the clonic sort. I judge so because they appear to extinguish life after the manner of those Narcotics that produce clonic Spasms.

Oscitation is considered to be Spasm by many. I am by no means sure that this view is correct. If it is Spasm, it must be a peculiar variety of the tonic sort. I have always considered it as having its seat in the nerves of expression. Sternutation is commonly considered as Spasm. If it is such, I do not think that it can properly be referred either to the tonic or the clonic sort, but rather belongs to a distinct species. I consider it quite doubtful however, whether it ought to be viewed as spasm. But whatever this affection may be, I have always supposed that it has its seat in the nerves of expression. Singultus is commonly called Spasm. Perhaps it is so, and perhaps it belongs to the sort called clonic. I have always considered it as having its seat in the nerves of expression. Bæx of all species (not more Bæx theriodes or Whooping Cough, than any of the rest) is always or nearly al-

ways reckoned as Spasm. The correctness of this view I consider as doubtful; but if it is Spasm, I should think it clearly of the clonic sort. I esteem it absolutely certain that it has its seat in the pulmonary par vagum, the involuntary motor nerve of the lungs themselves, and one of the nerves of expression. Possibly other nerves of expression are involved secondarily.

With the exception of Lyssa or Rabies, which consists of tonic and even Tetanic spasms of all the nerves of expression, I have now mentioned all the true and unequivocal Spastic diseases, except those having their seat in the nerves of voluntary motion. None of these Spastic affections are ever produced by any of the Erethistics when taken internally. There can be no such thing as tonic spasms, of either sort, throughout the whole of the involuntary nerve of chymical action nutrition and reproduction. There may doubtless however be Spasms or Convulsions in limited portions of both the systems of involuntary nerves, Spasms or Convulsions which do not by any means involve the whole. The regular contractions of the uterus in natural parturition are certainly very like that sort of tonic Spasms which occur in Tetanus, only they are confined to a single organ. Why may not a normal function be performed by actions that would be morbid, if they occurred when no such normal function is to be performed? If the normal parturient contractions of the uterus are not of a Spastic nature then I know of no Spasms having their seat in any part of the nerve of chymical action nutrition and reproduction.

Do any of the Erethistics ever produce a suspension of the functions of the hemispheres of the cerebrum; and if they do what is its nature and character? I am strongly inclined to think that they do, and that this suspension is a true and proper stupor analogous, if not exactly similar to the stupor of other parts of the system, which they occasion. But the external symptoms and phenomena are not quite adequate to prove this, and a patient can not well give a good account of himself during a suspension of the functions of his brain. Of course I do not insist that the Erethistics ever produce stupor cerebri. Perhaps they never suspend the functions of the hemispheres of the cerebrum at all; and the few cases of its suspension that I have attributed to them may have been produced in some other manner.

What subordinate parts of the nervous system do the Erethi-

tics more especially affect? Perhaps this question can not be answered to perfect satisfaction. Ignatia and the five Erethistic Strychni undoubtedly affect the nerves of voluntary motion more intensely than any other subordinate part of the nervous system. The Actææ as Ecboics and as producing violent and palpitating action of the heart and arteries, would seem to affect parts of the nerve of chymical action, nutrition and reproduction more especially. All those Erethistics that produce clonic Spasms (if there are any such) would seem to affect the nerves of voluntary motion especially; and yet, as all such destroy life by means of great constitutional irritation accompanied with rapidly progressive exhaustion of the energies and powers of the nerve of chymical action nutrition and reproduction, they would seem to affect this latter nerve more especially. But though these may be the subordinate parts of the nervous system upon which the Erethistics act more especially, yet I suspect that like the Narcotics they affect the whole of it in a greater or less degree, and hence, in my definition, I have allowed them to operate upon "any function." It is possible that this may be too great latitude, though I think not at present. Though perfectly satisfied that there is good foundation for this class, yet I do not pretend to understand it as well as I think I understand the Euphrenics, the Oresthetics, the Adenagics, etc. other new classes which I have proposed. This and the class Neuragics require much more study and investigation than I have had opportunity to bestow. I hope that some body else will pursue the subject much further.

In what manner does an Erethistic power destroy life? The first group are the Erethistica torpentia, which are both Tonic and Adenagic, in addition to their Erethistic power, a group which I consider as the best type of the class, viz. those agents, whose principal if not sole powers depend upon the two Alcaloids Strychnina and Vomicina, or more properly upon Salts of the Oxyds of the two compound radicals Strychninum and Vomycinum, destroy life solely and exclusively by the production of that sort of tonic spasms which constitute Tetanus and which have their seat in the muscles of voluntary motion through their voluntary motor nerves. It will be recollected that the muscles of respiratory motion, receive both voluntary motor nerves and involuntary and expiratory motor nerves. Now if these muscles are fixed in

a Tetanic Spasm for a certain length of time, either through their voluntary motor nerves or their involuntary and expressory motor nerves, death is the inevitable consequence. In Tetanus life is destroyed by such Spasms through the voluntary motor nerves, while in Lyssa life is destroyed by the same sort of Spasms through the involuntary and expressory motor nerves. Now the group of Erethistics that I have just specified produces a true and proper Tetanus, but never a Lyssa.

Are the Erethistics capable of destroying life in any other manner, except through the instrumentality of Tetanic Spasms? The Aconita, I am bound to believe, by what seems to be good testimony, destroy life by suspending the functions of the nerve of chymical action nutrition and reproduction. This conclusion is according to the facts stated by Pereira, though Brodie considers that they do this after the manner of Cyanid of Hydrogen, Benzhyliid of Hydrogen, Empyreumatic Essential Oil of Nicotiana Tabacum, etc. which is by suspending the functions of the nerves of expression. For myself I never saw life destroyed by any Aconitum; but I have several times seen the effects of rather an excessive dose in relation to the susceptibility of the subject, and there was always complaint of what was called "a setting of the jaws." At the time, I considered this as indicative of a tendency to Trismus, if not the very beginning of it, and I inferred that if enough of the Aconite were to be given it would produce true and proper Tetanus. But this must have been an erroneous conclusion if the Aconita destroy life as Pereira's facts would lead us to conclude or even as Brodie supposes. No article capable of producing Tetanic Spasms would ever destroy life in either of these ways. There is a general stiffness or rigidity of the trunk and limbs in the exquisitely clonic spasms of Epilepsy, and why may not the jaws be set in connexion with this? I can not say however that I ever observed them to be so, in this last mentioned disease, though I never made any inquiry in relation to this matter. I can not conceive of any article's possessing the power of producing Tetanic Spasms without the capability of destroying life through their instrumentality or indeed with the capability of doing it in any other way. In accordance with this view, I have heretofore stated, that in all probability the Aconita will be found to produce clonic Spasms. I do not know how any

other Erethistics destroy life. The Actææ I have seen strongly threaten Spasms or Convulsions, and as they produce Ecbotic effects, I think we may safely take it for granted that they produce those of the common variety and the tonic sort. But these never destroy life so far as I am apprised. This leaves us two modes only, in which Erethistics are known to prove fatal; but these seem to be too diverse to belong to one class. The two modes in which Narcotics kill, are very similar; but the two in which the Erethistics are here supposed to produce this effect are by no means similar; they are not even analogous. Now there is certainly no mistake in regard to the *modus moriende* under fatal doses of Ignatia and the five Strychni which operate in the same manner, and therefore I can not get rid of the impression that there must be some mistake in regard to the Aconita, either as respects the sort of Spasms or Convulsions which they produce, or the manner in which they destroy life.

This class is entirely new in the *materia medica*, as is the term Erethistica as its name. The word only is ancient and classical. As I have before said in the synopsis of the classification, my friends who objected to all formal classification had an especial antipathy to this proposed class, so that, as a public instructor I omitted to mention it enumerating the articles which it comprises in the class Narcotics. But I could never see the propriety of reckoning Ignatia amara, Strychnos Nux-vomica, etc. as Narcotics, when all their medicinal operative effects are so widely different and even opposite. I therefore submit this class to the public with perfect indifference as to its reception. As appears to me the subject is one of some importance, and that the views which I have here given can not fail of throwing some light upon it and lead to further investigation.

The different terms that have been applied to the articles of this class are the following, viz.:

Narcotica. The articles which I refer to this class are most commonly ranked in the class Narcotica, though their operations and effects are perhaps always referred to the Stimulantia, Incitantia or Excitantia. This apparent contradiction will not be deemed at all surprizing when it is recollected that John Murray and many others of his time, considered the Narcotica as primarily and essentially Stimulantia, Incitantia or Excitantia, and as only

secondarily and consequently Sedativa or Sedantia. Under this view it would seem to have been more proper to have applied one of the terms Stimulantia Incitantia or Excitantia to such a class. But Strychnos toxifera, Rouhamon Gujanensis, Rouhamon? Curare, Protocyanid of Hydrogen, Digitalis purpurea and various other Narcotics which can not be made to produce a particle of any effect that has ever been called Stimulant, Incitant or Excitant, would fall under these denominations with a very ill grace. To remedy this difficulty a few authors on the materia medica have adopted a class Sedativa or Sedantia to which the refractory Narcotics that can not be made to Stimulate, Incite or Excite have been referred. This however does not in any way affect the difficulty in regard to the classification of the articles that I am considering, since the difficulty is to obtain any operation or effects from them that can be called Narcotic or Sedative.

Stimulantia, Incitantia et Excitantia. By those who admit a Class Stimulantia, Incitantia or Excitantia distinct from the Narcotica; the most prominent of the articles which I have been considering are referred to such class, I trust that hereafter I shall be able to show that such class, whenever it has been adopted, has always been made to comprise at least four different and distinct powers, viz. that upon which I found what I call Erethistica, (the class now under consideration) that upon which I found what I call Euphrenica; that upon which I found what I call Oresthetica, and that upon which I found what I call Antisbestica. As I come to each of these classes respectively, I trust I shall be able to show satisfactorily how they differ from each other.

Inebriantia et Intoxicantia. This class of articles has been called Inebriantia or Intoxicantia, as have the Narcotica and the Euphrenica. From what has already been said upon Intoxication or Inebriation, I need not pause here to show that an Erethistic operation merely is not an Inebriant or Intoxicant operation, and if in a given case it happens to accompany Intoxication or Inebriation, that it is not an essential but only an accidental part.

By some it may be considered an objection to this Class that it is founded upon such a very small number of certainly Erethistic articles, as well as that there are no simple and perfectly pure Erethistics; and yet such objections are very unphilosophical. If only a single individual article is known which possesses a distinct,

peculiar and unequivocal medicinal power, it would be amply sufficient to found a class upon. The propriety of the class depends upon the peculiarity of the power upon which it is founded, and not at all upon the number of articles which possess such power. For example, if the Protoxyd of Nitrogen were the only Euphrenic, it would not at all affect the propriety of the class.

The most unequivocal, and the most active Erethistics if properly prepared and administered, possess very considerable power of contributing to the relief of Paresis and Paralysis; of Acinesia; of Rheumatalgia; of Neuralgia vera; of Chronic Rheumatismus; and of Podagra; and as would seem, of various other diseases; especially if employed in the intervals of the acute exacerbating and remitting paroxysms of either of the above maladies that consists of such paroxysms. What other articles, that have ever been reckoned by authors, as Narcotics, beside these, which I insist are not true Narcotics, but in reality true Erethistics, possess any value whatever for the relief of Paresis and Paralysis? I answer confidently none, except *Rhus venenata*, *Rhus radicans*, *Rhus Toxicodendron*, etc. which in fact do not possess a particle of genuine Narcotic power, but are merely Erethistics, Antisbestics and Diuretics in conjunction, in perfect analogy with *Cantharis vesicatoria*. No true and mere Narcotic is of any avail, for the relief of Paresis and Paralysis.

Erethistics are allied on the one hand to Euphrenics, and on the other hand to Narcotics. As respects its analogies and affinities it appears to me that this class should be arranged between the Narcotics and the Euphrenics. In making this location, I attach no importance to the fact that the principal groups of my Erethistics, have been referred to the Narcotics. Many articles of the materia medica have long been intirely misreferred by authors and systematists, as much as *Strychnos Nux-vomica*.

ERETHISTICA TORPENTIA.

Benumbing Erethistics.

TURMA PRIMA.

PURA?

CORIARIA MYRTIFOLIA (*Linn.*)

This is the only species, I believe, that has actually been used in medicine; but the seeds at least, of all the rest are reputed to possess the same power. The other species are

- CORIARIA MICROPHYLLA (*Poiret.*)
- CORIARIA SARMENTOSA (*Forster.*)
- CORIARIA RUSCIFOLIA (*Linn.*)
- CORIARIA PHYLICIFOLIA (*Humboldt.*)
- CORIARIA THYMIFOLIA (*Humboldt.*)
- CORIARIA ATROPURPUREA (*Flor. Mexic.*)
- CORIARIA NEPALENSIS.

This constitutes the whole natural order. In the imperfect state of our knowledge of the Coriariaceæ we must reckon them as simple and pure Erethistics. Perhaps if we knew more of them we should find that they possess other powers; though I know of no particular grounds for suspecting it. How far these articles produce the effects that enter into the definition of this class, I am not able to say precisely, and therefore I am reluctant to place them at the head of the class, which seems to make them types of it; but the fact that they are simple and pure Erethistics, so far as we now know, constrains me to give them this position. They are said to produce as exquisite Tetanic Spasms or Convulsions as Ignatia and the five Erethistic Strychni; and such being the fact, it is fairly presumible that they destroy life after the manner of these last mentioned articles. I do not actually know that the Coriariaceæ belong to that subdivision of the Erethistics which I call torpentia, or that which I call non-torpentia; though I presume to the former, on account of their affinity with Ignatia and the five Erethistic Strychni, manifested by the production of Tetanic Spasms.

TURMA SECUNDA.

TONICA ADENAGICA.

- IGNATIA AMARA (*Linn.*)
- STRYCHNOS TIEUTÉ (*Les Chen.*)
- STRYCHNOS NUX-VOMICA (*Linn.*)
- STRYCHNOS COLUBRINA (*Linn.*)
- STRYCHNOS LIGUSTRINA (*Blum.*)
- STRYCHNOS POTATORUM (*Linn.*)

Ignatia amara and the five Erethistic Strychni here specified, of course produce all the effects particularized in the proper definition of this class, besides others in addition. At first view however they may not seem to agree with the essential part of the definition, since they may be made to give new and additional power or energy, instead of merely bringing into greater activity that which already exists. If this point however is properly examined, all apparent contradiction and inconsistency will vanish, and it will appear that they are capable by peculiar modes of management, of being made to produce, either one or the other of these effects, by itself, and that each depends on an intirely different and distinct medicinal power. For example, if these articles are given in larger doses and quantities, at short intervals, and in such an amount as barely to fall short of occasioning tonic or tetantic Spasms or Convulsions, there will be a high degree of Erethistic effect, without much if any Tonic effect. But if on the other hand, these agents are given in moderate doses at comparatively long intervals, and their use continued for a comparatively long time, no danger of Erethistic effects will be produced, but, on the contrary, they will prove very sure Tonics, and particularly of the nervous system.

Ignatia and the five Erethistic Strychni here enumerated, as I believe, have hitherto been reckoned as Narcotics; but with what foundation I will now inquire. I believe it may be considered as certain that these articles never produce any direct Antirritant, or any direct Anodyne effects. I believe it is certain also that they never produce any direct Stupefying or Soporific effects, under any mode of management; but on the contrary, always exert an arousing power; since under their full medicinal operation, all the susceptibilities to the appropriate impressions of most if not all other agents are more or less exalted. When pushed beyond the point of production of medicinal effects, there is no cloud before the sight or any other imperfection of vision; no epigastric uneasiness or distress; no faintness; no irregularity of the pulse; no coldness of the extremities or clammy sweats; no oppressive or dangerous coma, etc. from these articles. All of these constitute a greater or less portion of the ultimate effects of all true and proper Narcotics, that possess any material activity. When pushed beyond the point of the production of medicinal

effects there is nothing in their operation in common with the operation of the unequivocal and true Narcotics, unless it is the occasional production of a sort of vertigo, of a very peculiar character however, and Convulsions of an equally peculiar sort, viz. exquisitely tonic or Tetanic Spasms, which latter (so far as my observation extends) are not produced by any Narcotic, unless we reckon these agents viz. the Erethistics, as such. If Ignatia, and the five Erethistic Strychni are excluded from the true and proper Narcotics, I believe that no article of this class is absolutely and certainly known ever to produce exquisitely tonic or Tetanic Spasms or Convulsions as a part of its ultimate effects. Perhaps the power of Ignatia and the five Erethistic Strychni to produce stupor or numbness, of the lower extremities more especially (i.e. a state or condition identical with what is called being "asleep,") may be considered as indicating a tendency towards a Stupefying or Soporose power; but, if it does, this is such a Stupefying or Soporose power as no mere and pure Narcotic ever exerts, so far as I have knowledge. This is a very peculiar effect, and one which it is not worth while to confound with what is commonly called either Stupefaction or Somnolency, as produced by the true, unequivocal and pure Narcotics. The tingling and prickling numbness, and formication (called technically Stupor, numbness being the etymological import and acceptation of this term) assimilates Ignatia and the five Erethistic Strychni with the Aconita, which will be specified as the next group of Erethistics.

Ignatia and the five Erethistic Strychni produce some effects, as Erethistics which do not enter into the definition of this class. Cephalodynia or Head-ache is one of the ultimate effects of excessive doses of these articles. This is a still more common effect of excessive doses of the Actææ. Ignatia and the five Erethistic Strychni produce great restlessness and jactitation; violent neuralgic pains in various parts, and what it is the fashion to call vaguely enough "tumultuous action of the heart and arteries," as a prominent part of their ultimate operative effects, when given in excessive and inordinate doses and quantities. All of these ultimate effects are likewise produced by the Actææ. In connexion with the stupor of the lower extremities, as produced by the Ignatia and the five Erethistic Strychni, at least when it is intense, there is often an inability to use the limbs affected by the stupor.

This inability seems to consist in a want of nervous power. Effort, exertion and exercise seem readily to restore this lost nervous power and to dispel the inability for action. One of my patients once informed me that excessive doses of Ignatia always produced in him violent palpitation of the heart, together with a sensation as if this organ turned over. The same phenomenon is said to be likewise perceptible by a hand pressing externally upon the region of the heart. At the same time the pulse is said to intermit frequently, more especially when the subject is in a horizontal position. Although I have not been in the habit of seeing these latter symptoms from this group of articles, yet I can readily credit this statement, since I have met with these symptoms exactly in idiopathic diseases of the heart. I once had a case, in which beside great palpitation, there was a sensation perceived by the hand when applied externally, exactly as if the heart turned over about three times in a minute. In this instance however there was no accompanying intermission of the pulse, or any other irregularity. This symptom totally disappeared, at least for the time being, under the sedative influence of a Tincture of the root-tubers of *Cicuta maculata* (*Linn.*) At the same time, there was a great abatement of the palpitation, as well as the seeming rolling over of the heart. To what this last phenomenon was due, I was never able to determine. The pulsations in this case were regular and equal in all respects and could be distinctly counted. These effects undoubtedly assimilate Ignatia and the five Erethistic Strychni to the Actææ.

I presume that the power of these articles to restore impaired or lost energy in one grade of their operation, and seemingly to impair or destroy it, in another grade of their operation, would be interpreted by a homeopathist, in favor of his professed views; and no doubt it might be, with full as much truth as the other cases which are so interpreted. These symptoms that I have just detailed, I view as the ultimate effects of the same Erethistic power which produces the principal remedial effects and which relieves Acinesia and Paralysis. I do not deem it at all strange that one grade of the operation of this power should be productive of a true and real increase of nervous energy, while another grade should seem to be productive of a material impairment of it. This seeming impairment, as appears to me, is perceived only

at that point of the operation of this group, when the will begins to lose power over the voluntary muscles; and in reality it consists in a loss of the power of the will over them, rather than in a loss of nervous energy. The next grade of effect would be Tetanic Spasms. It is no way strange however that an ultimate grade of the operation of any active remedy, should be inconvenient, disagreeable, injurious or even noxious, while the primary and medicinal grades should be pleasant, salutary and eminently remedial. There is no need therefore of supposing that a new power is brought into operation when these articles seem to impair nervous energy.

I have long been convinced that the unfortunate application of the term Narcotic to these articles has very frequently, indeed very generally misguided and misled authors and practitioners of medicine; and I venture to say that from these circumstances merely, two-thirds or three-fourths or probably a still greater proportion of the medical profession entertain the erroneous belief that like the true and unequivocal Narcotics, these articles possess and exert direct and immediate Antirritant, Anodyne, Soporific and otherwise direct Sedative and Stupefying powers; and that they obtund rather than exalt all the susceptibilities. Such an erroneous application of terms certainly has far more influence in creating, propagating and perpetuating error than is commonly understood or believed, so that the common saying that "it is no matter by what name a thing is called" is the very antipodes of truth.

Ignatia amara is the sole species of this Loganiaceous genus. Its powers are as like those of the *Strychni*, that are associated with it, as is possible. Indeed it contains identically the same active principles, viz. the Alcaloids *Strychnina* and *Vomicina*. Out of twenty-eight and perhaps thirty species of the Loganiaceous genus *Strychnos*, only five are definitely known, or indeed known at all, to possess the power, upon which this class is founded. One species is alleged to be a pure bitter Tonic, and as is further asserted, of the same character as *Cinchona*. This I consider doubtful. One other species still is certainly known to be a simple and pure Narcotic, of that group which acts more especially upon the nerves of expression and respiratory motion, like *Cyanid* of Hydrogen. One other species even in addition to these is said by

some to have the same power as the last, but this is positively denied by others who are perhaps better authority. What the truth is I have no means of knowing. Of all the Erethistic Strychni, the Alcaloids Strychnina and Vomicina are the active principles. Of the pure Tonic Strychnos, the active principle is intirely unknown. Of the pure Narcotic Strychnos the Alcaloid Curarina is the active principle. It is highly probable that a greater number of the species of this genus are medicinal; and as five at least agree in containing the same active principles, and in possessing the same powers, it is equally probable that a still greater number may do this; but as there are at least two intirely different and distinct powers possessed by two other species, it is possible that some one or more of the uninvestigated species may be found to agree in power with one or the other of these two; or they may have intirely different and distinct powers; or they may even be inert. Under such circumstances, conjecture is useless; and certainly it is wholly unwarrantable to maintain that all the species have the same powers, as some writers actually do, in defiance of what we know of Strychnos toxifera, and if what is alleged by the best authorities, as would seem at least, in regard to Strychnos Pseudo-Quina. However the strangest thing of all is that, in view of the utter and total diversity in the powers, operations and effects of Strychnos toxifera, and this in conjunction with an analysis demonstrating an equally utter and total diversity of active principles, Humboldt should still believe, and Martius should still assert of Strychnos toxifera "cortex multo Strychnino pollens," etc. It is deemed strange however that one species of a genus should be so intirely different in power from other species, each being so extremely active in such opposite ways. The matter would seem a little less extraordinary if it could be made to appear that Strychnos toxifera is not a true Strychnos, but rather a Rouhamon or the type of another genus. But in defiance of all that we know, the five Erethistic species of Strychnos are a paradox in the materia medica, on account of their singular peculiarities of operation, at least in some respects, in comparison with all other medicinal agents at present known. The strange and utter diversity of the powers of different species of the genus Strychnos can not fail to teach a useful lesson in regard to the value of botanical affinities as a guide to medicinal powers. As several species have

similar, indeed identical powers, the fair inference is that botanical affinities ought not to be wholly neglected in researches in regard to the *materia medica*, in as much as they some times lead to the exact truth, and some times furnish a clue, not to similar, but only to analogous powers. Again as species of the same genus are often so widely diverse in their powers, we learn that no positive reliance is to be placed upon botanical affinities, independent of careful and thorough investigation of each individual article. So far as I am informed, this is a brief summary of what is known in regard to the medicinal powers of the true *Strychni*; and is all that is necessary in this place.

T U R M A T E R T I A .

ORÆSTHETICA? ADENAGICA?

Sub. Gen.

ANTHORA.

ACONITUM ANTHORA (*Linn.*)

LYCOCTONUM.

ACONITUM LYCOCTONUM (*Linn.*)

ACONITUM OCHROLEUCUM (*Willdenow.*)

ACONITUM BARBATUM (*Patrin.*)

CAMMARUM.

ACONITUM VARIEGATUM (*Linn.*)

ACONITUM GIBBOSUM (*Seringe.*)

ACONITUM ROSTRATUM (*Bernhard.*)

ACONITUM HEBEGYNUM (*De Cand.*)

ACONITUM PANICULATUM (*La Mark.*)

V. STERCKIANUM (*Seringe.*)

ACONITUM JAPONICUM (*Thunberg.*)

ACONITUM UNCINATUM (*Linn.*)

ACONITUM SPECIOSUM (*Otto.*)

ACONITUM TORTUOSUM (*Willdenow.*)

ACONITUM GILIARE (*De Candolle*)

ACONITUM MAXIMUM (*Pallas.*)

ACONITUM PRODUCTUM (*Reichenb.*)

ACONITUM MOLLE (*Reichenbach.*)

ACONITUM EXALTATUM (*Bernhard.*)

ACONITUM INTERMEDIUM (*De Cand.*)

NAPELLUS.

ACONITUM NAPELLUS (Linn.)

ACONITUM FEROX (Wallich.)

ACONITUM BIFLORUM (Fischer.)

(De Cand. Prod. Syst. Nat. Reg. Veg. Præ. I. Pg. 56. 64.)

There are three other species discovered since the publication of the preceding work. I do not know to which sub-genus they respectively belong, and therefore I arrange them by themselves.

ACONITUM RECLINATUM (A. Gray.)

ACONITUM NASUTUM (Fischer.)

ACONITUM COLUMBIANUM (Nutt.)

(A. Gray. Man. Pg. 73 et. 14. Torr & Gray. Flor. Vol. I. Pg. 84.) As all the species of the genus Aconitum are said to possess the same medicinal powers I have given a catalogue of the whole of them according to De Candolle's Prodrômus, adding the three new species that have been discovered and described since the publication of that work. Under many of the species a great number of varieties have been described and named; but then I do not think it necessary to particularize, with one single exception viz. that which Stœrck employed. When I treat in detail of the powers operations and effects of the Aconita, I shall mention such only as I know to have been employed in medicine. Turnbull says that "along with the acrid principle there exists a powerful Narcotic property in the Aconites." (A. Turnb. M. D. Med. Prop. Ranunculaceæ Lond. 1835 Introd. Pg. 3 Lns. 6 to 8.) How many proximate principles there may be in the Aconita I know not, but I know of no other Narcotic property in any of them than that to which I apply the term Erethistic; and this, as appears to me, is quite different and distinct from any true and genuine Narcotic power of any species or variety. In suitable cases, and in doses properly adapted to the circumstances of the patient, I have always found the Aconita to produce all the operations and effects mentioned in the proper definition of the Erethistics, as well the stupor of the extremities, and even of the whole trunk, as the rest of the symptoms. I have repeatedly heard patients familiar with the operation and effects of Ignatia and the five Erethistic Strychni, declare while under the influence of Aconitum Napellus, that their sensations were very much like

those produced by those particular articles. Besides the tingling prickling numbness and formication or in one word stupor such patients have frequently mentioned perceiving the same nameless sensations; the same neuralgic headache, and the same stiffness of the jaws. Under the use of Aconite, patients some times complain that the lightest bed-clothes are a burden, they feel unable to make a full inspiration, not on account of pain, but apparently from want of nervous energy. Some times under too free a use of Aconite, the face and hands become quite cold to the feel of another person, as well as to the patient, and the pulse becomes quite infrequent. I have known of its being as infrequent as thirty-six in a minute. But all these symptoms are transient and fugitive, and usually pass off speedily, from mere suspension of the use of the medicine, without any aid from remedial agents.

Do the Aconita ever produce great restlessness and jactitation; violent neuralgic pains, and the so called "tumultuous action of the heart and arteries," as a part of the ultimate operative effects of excessive and inordinate doses and quantities, in analogy with the Actææ hereafter to be mentioned? I have no knowledge that they ever produce any aggregate of effects like these. Do the Aconita ever produce any sort of Spasms or Convulsions, as a part of their ultimate operation, in analogy with Ignatia and the five Erethistic Strychni, and in all probability in analogy with the Actææ? So far as I have positive knowledge they do not. And yet, I have heard patients that were under the influence of an inordinate quantity of Aconite complain of what was called "a setting of the jaws." This we should naturally suppose might indicate the approach of Tetanic Spasms; and yet this can not be the fact, since all those articles that produce Spasms of this sort, always destroy life through their instrumentality, which is certainly not the way persons die by Aconite. I am inclined to think that this "setting of the jaws" so called, is merely a suspension of nervous energy, and a consequent inability of the muscles to obey the will. Acinesia of the muscles of mastication and also of the muscles of deglutition, are very frequently mistaken for Spasms. I have known this mistake very often. If the Aconita produce any sort of Spasms or Convulsions I think they must be of the clonic sort, and indeed absolutely Epileptic, since persons die from Aconite in the same manner as they die

under Epileptic Convulsions. On the whole, I am disposed to believe that the Aconita are capable of producing Epileptic Convulsions though I never saw them so produced. This belief however must not be mistaken for actual knowledge. From the best authority I think we must conclude that the Aconita destroy life by a suspension of the functions of the nerve of chemical action, nutrition and reproduction. Pereira's facts seem to prove this conclusively. But even admitting that they destroy life by suspending the functions of the nerves of expression, as Brodie says indirectly, and as I believe incorrectly, they can never by any possibility produce Tetanic Spasms, since all articles that produce these, I believe, invariably destroy life by their instrumentality. There may, however, be some error to be corrected, or some thing additional to be ascertained, in relation to this subject.

? *ARNICA MONTANA* (*Linn.*)

DORONICUM PARDALIANCHES (*Linn.*)

Under a free use of the best preparations of *Arnica montana*, that I have ever been able to obtain, I have often known full doses produce what the patients called a thrilling sensation perceived even in the minutest extremity. In often repeated but smaller doses, patients have informed me that it produces a sensation of formication, pricking and tingling in the skin; but I never knew it produce positive stupor of the lower limbs. I am inclined however to believe that a sufficiently concentrated preparation in sufficiently large doses and quantities, might produce this effect. *Arnica montana* is commonly said to exert a peculiar and specific influence over the nervous system, and when pushed to a certain extent, to produce head-ache, vertigo, disturbed sleep, etc. On this account it is usually reckoned to be a Narcotic. But other effects beside these are necessary to prove a Narcotic power. But at all events, I have long been perfectly satisfied that *Arnica montana* has a strong resemblance to the Aconita, in its medicinal powers operations and effects, and of course in its therapeutic applications. In addition to this, *Arnica montana* seems to be adapted to relieve the very same diseases for which the Aconita are the most effectual. I learned the use of *Arnica montana* in Acinesia, in Pareses and Paralyzes, in Rheumatgia and Neuralgia-vera, in the chronic and protracted stages of Rheumatis-

mus and Podagra, etc. while I was a professional pupil; but under the impression that it was a Narcotic — an acrid Narcotic as was said. After I became better acquainted with the article, from prescribing and managing it myself, I found it impossible, at least with such preparations of it as I could obtain, to produce any Narcotic operation or effect. After trial of it for a considerable period of time, I was compelled to abandon the notion that it is a Narcotic at all; and I finally concluded that it possesses only that power which I subsequently distinguished by the term Erethistic. However I think it quite probable that it may be Oresthetic also, though of this I am not quite sure; but whether it is or not, it certainly agrees in its operations and effects, at least in very many respects if not in all, with the Aconita; though its flowers (the only part which I was ever able to obtain till about 1829) are a far weaker agent than the best root of Aconitum Napellus.

It appears to me then to be very probable, perhaps certain, that *Arnica montana* which almost all the authors on the materia medica, of which I have any recollection, reckon to be a Narcotic, is in reality an Erethistic after the manner of the Aconita. I have long been convinced, as I have already said, that it certainly is not at all Narcotic, since I have never been able to produce any degree or quality of a Narcotic operation or effect, by any quantity that any patient would ever take. I was at last constrained, as I have said, to consider it as a mere and pure Erethistic and perhaps Oresthetic. It certainly appears to possess moderate Oresthetic powers, but if it does, I think that its Oresthetic operation is more in analogy with the Oresthetic operation of the Aconita, than with any thing else. I am inclined however to think that it must be mainly Erethistic in the same manner and of the same quality as the Aconita, and that this must be the power which authors on materia medica have called Narcotic; but with me this requires further investigation, before it can be considered certain. In the mean time I mention it with the Erethistics with a query? As a free use of *Arnica montana* sometimes produces a speedy or rapid resolution of Rheumatismus acutus, or seems to do so, I infer that it is more or less Adenagic.

Whether *Arnica montana* in inordinate and excessive quantities, is capable of producing any sort of Spasms or Convulsions

I know not; but from its great resemblance to the *Aconita* in sensible and occult properties, I am not inclined to doubt that it is capable of operating as they do, in this respect. As respects the manner in which it extinguishes life (if it is capable of doing this) I suppose that it will likewise agree with the *Aconita*. Some of my last turmæ or groups of this class, I believe, destroy life by the production of great constitutional irritation, accompanied with rapid progressive exhaustion of the energies and powers of the nerve of chymical action nutrition and reproduction. I do not know that this is materially or essentially different from the manner in which the *Aconita* extinguish life; but if it is, this may be the way in which *Arnica* operates. I have never seen death produced by any of these articles, and authors are so loose and vague in their statements on such subjects, that no definite and precise knowledge can be obtained from them. During the early part of my practice I was unable to obtain any other part of this plant, for medicinal purposes, than the flowers, and these are certainly feeble in proportion to their bulk. Of their Tincture a comparatively large dose was always required to produce any very unequivocal operative effects. As it is very disagreeable to the taste I always found it difficult to persuade patients to push it far enough, and to continue its use long enough, to obtain any very decided and immediate operative effects. As this plant is persistent, and consequently with an annual top, it has a perennial root, I doubted not that this latter part would be far the best for medicinal purposes. At last I succeeded in obtaining some, and thus made a far more concentrated and a far better Tincture, which was much more uniform in strength, and much more convenient of management. With this I was able to accomplish more than I had ever before accomplished with the Tincture of the flowers! It is now several years since I have employed any other preparation.

As to *Doronicum Pardalianches*, I have no personal experience of its use, but if testimony can be relied on, its powers, operations and effects, are very like those of *Arnica montana*, and it must be quite as destitute of any thing like true and proper Narcotic powers. From the best testimony that we possess in regard to this article, what has been said in regard to *Arnica montana*, may be said also of this species of *Doronicum*. It may possibly vary

from Arnica in the degree of its activity, but in all other respects it is supposed to be essentially the same.

NERIUM OLEANDER (*Linn.*)

NERIUM ODORUM (*Willd.*)

WRIGHTIA ANTIDYSENTERICA (*R. Brown.*)

ECHALIUM PISCIDIUM (*Wight.*)

These four articles would seem to be most unequivocal Erethistics, and not Narcotics, as they are universally called, since they seem incapable of producing any direct Antirritant, Anodyne or Soporific effects. In fact I consider them as very like the Aconita in their powers, operations and effects, as unlike as they are, in their natural affinities. But it must be admitted that there is one serious objection to considering any part or the whole of this turma or group as Non-Narcotic-Erethistics, viz. the speed or rapidity with which they destroy life, and the manner in which they do it. The extinction of life by a suspension of the functions, either of the nerves of expression, or of the nerve of chymical action nutrition and reproduction, and the production of the one or the other of these effects speedily or suddenly, would seem to belong to the Narcotics, and not to any other class of remedies. Is there any other turma or group of unequivocally Non-Narcotic-Erethistics that extinguish life after the manner of either subdivision of the Narcotics, i. e. by suspending the functions either of the nerves of expression, or of the nerve of chymical action nutrition and reproduction? I am not apprised that such is the fact unless it should be so with the Rhododendreae. These however are as strongly suspected of being Narcotic-Erethistics, as the group I am now considering. This is certainly a suspicious fact in reference to the Non-Narcotic properties of this turma or group. But the rest of the Erethistics certainly do not all extinguish life in the same manner. Ignatia and the five Erethistic Strychni extinguish life in a way peculiar to themselves. The same, I doubt not, is equally true of the Actææ. It is my present belief that the Clematideæ, Anemoneæ, Helleboreæ and Daphnaceæ all extinguish life in a manner different from any previously specified group. But the great difficulty is that only one group perhaps, extinguishes life after the manner of one set of the Narcotics.

I am not absolutely certain that the next turma or group is truly Erethistic, rather than Narcotic, though I believe that it is. The articles of which the group is composed are always said to be Narcotic; and yet so far as my acquaintance with them extends, they never produce Narcotic effects, according to my definition. But though I have used some of them to a considerable extent, I have always been contented with their bare remedial effects, and have never pushed them so far as to obtain their ultimate effects beyond those which are remedial merely. It is however the power, which has thus far given them the reputation of being Narcotic or Acrid-Narcotic as they are commonly styled, which I suppose to be an Erethistic power, and not a true Narcotic power, at least according to my definitions and understanding of the terms Narcotic and Erethistic, which I think I have showed to be different and distinct powers. It is said by some that *Rhododendron Chrysanthum* is directly and considerably Soporific. If it is so it is doubtless Narcotic. But even if it is admitted to be Narcotic, it does not by any means follow that it is not Erethistic. But I never could obtain the least direct Soporific effect, nor any other effect indicative of a Narcotic power from *Rhododendron maximum*, or any species of *Kalmia* that I have employed. Has there not, therefore, been a mistake in regard to the direct Soporific effects of *Rhododendron Chrysanthum*? Has not the sleep which follows relief from pain, etc. been mistaken for a direct Soporific operation? Is it likely that *Rhododendron Chrysanthum* and *Rhododendron maximum* agree as respects an Erethistic power, but disagree as respects a Narcotic power? They may do so, I doubt not, since *Veratrum album* is Cathartic, while *Veratrum viride* is destitute of any Cathartic power, though I believe they agree medicinally in all other respects. I have always believed however that all these articles are more or less Adenagic, as well as Erethistic, having always prescribed them under this view, and with as much success as I have prescribed many of the unequivocal Adenagics. I do not therefore entertain any doubt that they are more or less Adenagic, whether they are Narcotic or Erethistic.

TURMA QUARTA.

ADENAGICA.

- RHODODENDRON CHRYSANTHUM (*Pallas.*)
- RHODODENDRON PONTICUM (*Linn.*)
- RHODODENDRON FERRUGINEUM (*Linn.*)
- RHODODENDRON CAMPANULATUM (*De Cand.*)
- RHODODENDRON MAXIMUM (*Linn.*)
- RHODODENDRON PURPUREUM (*G. Don.*)
- RHODODENDRON PURSHII (*G. Don.*)

The last two are by some botanists reckoned as varieties of *R. maximum*.

- RHODODENDRON MACROPHYLLUM (*G. Don.*)
- RHODODENDRON CATAWBIENSE (*Michaux.*)
- RHODODENDRON PUNCTATUM (*Andrews.*)
- RHODODENDRON LAPPONICUM (*Wahlenberg.*)
- RHODODENDRON ALBIFLORUM (*Hooker.*)
- AZALEA PONTICA (*Linn.*)
- KALMIA LATIFOLIA (*Linn.*)
- KALMIA ANGUSTIFOLIA (*Linn.*)
- KALMIA CUNEATA (*Michaux.*)
- KALMIA GLAUCA (*Aiton*)
- KALMIA ROSMARINIFOLIA (*Pussl.*)

De Candolle makes this a variety of *Kalmia glauca*.

- KALMIA HIRSUTA (*Walter*)

There are forty-four species of *Rhododendron* described by De Candolle. So far as I have knowledge, only four of the foreign ones are certainly known to be active, and these I have mentioned. All of the American species are supposed to be active, and accordingly I have mentioned the whole; but I suspect that none of them except *Rhododendron maximum*, have ever been very thoroughly tried. I include in the genus *Rhododendron* none but the sempervirent species, leaving the deciduous-leaved species in the genus *Azalea* where they have long been placed by most botanists, and where De Candolle still retains them.

All the species of *Kalmia* (or *Calmia* as it should be spelled, since there is no *K* in latin except in *Kalendæ*, and this is often spelled with a *C*, and since the genus named from *Kamel* is always spelled with a *C*) are American. I have mentioned the

whole, though I suspect that only the first two have been much used in medicine. I am disposed to believe that the active species of *Kalmia* are all Erethistic. If they are Somnific, I suppose they must be Narcotic in addition; but I never witnessed any Somnific effect from either of the species that I have employed.

LEDUM PALUSTRE (*Linn.*)

LEDUM LATIFOLIUM (*Aiton.*)

I am very strongly inclined to believe that *Ledum latifolium* and *Ledum palustre* are Erethistics. Do they ever produce Somnolency? If they do, they are Narcotics likewise; but I have never witnessed Somnolency from them. I have never used them much however.

I consider the next five articles of this turma or group as much more doubtful Erethistics than the preceding twenty-one; and the next four as much more doubtful still. But I hope my suggestions will provoke inquiry and lead to certainty.

?ANDROMEDA POLIFOLIA (*Linn.*)

{ ?LEUCOTHOË MARIANA (*De Cand.*)

{ *Andromeda Mariana* (*Linn.*)

{ ?CASSANDRA CALYCVLATA (*G. & D. Don.*)

{ *Andromeda calyculata* (*Linn.*)

{ ?PIËRIS OVALIFOLIA (*D. & G. Don.*)

{ *Andromeda ovalifolia* (*Wallich*)

The preceding *Andromedeæ* are considerably employed in medicine, and are commonly reckoned as Narcotic Poisons. They are reputed to be capable of poisoning Goats, which are more difficult to be poisoned by true and proper Narcotics than any other brute mammal within my knowledge. I have employed three of these articles somewhat, but never saw anything like a Narcotic operation. I have lately supposed them to possess the same powers as *Ledum*, *Kalmia*, *Azalea*, *Rhododendron*, etc. They have always appeared to me to be more or less Adenagic. Indeed I think I have witnessed more evidence of their Adenagic, than of their Erethistic power.

I am better acquainted with *Leucothoë Mariana* than with any other of the *Andromedeæ*, and I have formerly been in the habit of considering it as analogous or even similar to *Arctostaphylos Uva-Ursi*, only considerably more active. If we can con-

fide in testimony however, not only these articles, but even Uva-Ursi have a power or powers which I never suspected at the time when I first associated them medicinally. A physician may doubtless employ an article for a long time in reference to a single power, without ever detecting other powers, which may be prominent when the article is pushed to a much greater extent. For example, Alcohol is ordinarily employed for what is commonly called its stimulant operation i. e. for its Oresthetic, Euphrenic, Erethistic and Antisbestic effects. I do not think that its Narcotic power would ever have been detected by its employment for this purpose, as prominent as it now is, when pushed to the production of intoxication. This will explain how it happens that new powers are so often discovered in old articles—articles that have been in use almost time immemorial.

?ARCTOSTAPHYLOS UVA-URSI (*Spreng.*)

If this article is really and truly Ecboic, as it has of late been reputed to be, may it not be found to be Erethistic also? This we might suspect from its natural history affinities, if these were of as much value for ascertaining medicinal powers as they are commonly reckoned to be. As ordinarily found in the shops, I have commonly been in the habit of reckoning it as just about inert, though I have always supposed that when recently collected and at the most proper time, it would prove more or less active. From the best testimony that I have received in regard to its effects when of the best quality, I have always supposed it to be Adenagic merely, and I have always associated it medicinally with *Chimaphila corymbosa*, *Chimaphila maculata*, etc. I have also considered *Barosma crenulatum*, *B. crenatum*, *B. serratifolium*, *B. Betulinum*, *B. pulchellum* and every other article collected and sold as Buchu or Bookoo, and even *Adenandra uniflora*, as belonging to the same group medicinally. If however *Arctostaphylos Uva-Ursi* is really Ecboic, it must possess a power which, so far as I know, has never been suspected to belong to the above specified articles, and which must associate it with a different group of agents. Not happening ever to have resided in the immediate neighborhood of any place of its growth, I have always neglected to make a proper investigation of its powers.

?ISNARDIA PALUSTRIS (*Linn.*)

By some this article is reckoned as an effectual Antispastic. But all the articles so called are such by virtue of some of those powers which I have made the foundation of a class in the *materia medica*. But what power does this agent possess? It has been conjectured to be Narcotic. I do not think that it is truly such, in any degree; nor that it is at all Euphrenic. But there is much testimony to its powers of relieving some cases of *Dyspnœa exacerbans*. Now if it is not Erethistic, I do not know what it is. It is suspected by some to be Adenagic also; but I have never made any investigation in this direction. This agent very much needs a thorough examination.

} ?*DECODON VERTICILLATUS* (*Elliott.*)
 } *Decodon aquaticus* (*Gmel.*)

I have mentioned this article among the Narcotics, though I consider it as more than doubtful whether it possesses any Narcotic power. It has been considered by some as possessing that power which I call Adenagic. I consider it as more probable that it is Erethistic. But I have never seen it produce either of these effects. However I have not used it sufficiently to be master of its powers, operations and effects. If any thing can be established in medicine, by the testimony of those not belonging to the medical profession, it may be considered certain that this agent is Ecbotic. I have likewise received considerable medical testimony to the same effect. Now the most active and the best Ecbotics are either Narcotic or Erethistic, which may perhaps be considered as proving the opinion that this article is one or the other. I hope that somebody will investigate this subject thoroughly.

? *AMMANNIA HUMILIS* (*Mich.*)

? *AMMANNIA RAMOSIOR* (*Linn.*)

The United States species of *Ammannia* have the popular reputation of being medicinal, but what their medicinal powers are, this reputation does not decide, as is very often the fact, in the case of popular medicines. Having had no experience in the use of these articles, I can make no decision in regard to this point, at least from my own observation. As the two species which I have specified have been vaguely said to be Deobstruent, which very often means Adenagic, and as they belong to the same nat-

ural-history order and tribe with *Decodon verticillatus*, I can only conjecture that they may be Erethistic, as I have conjectured that article to be. It must be admitted however that I have not as good grounds for the conjecture in the case of the *Ammannia*, as in the case of *Decodon*, since there is so much testimony to the Ecboic power of the latter, which favors the conjecture that it may be Erethistic.

TURMA QUINTA.

ORÆSTHETICA ADENAGICA

EMETICA.

VERATRUM VIRIDE (*Aiton.*)

SANGUINARIA VERNALIS (*Salisbury.*)

LOBELIA INFLATA (*Linn.*)

I have repeatedly seen a very obvious, indeed prominent degree of that part of an Erethistic operation, on which the primary part of my definition is founded, produced by *Veratrum viride* and *Sanguinaria*, more frequently in children, but repeatedly in adults. I do not feel equally confident of ever having seen them produce those effects, in any decided degree, on which the secondary part of my definition is founded; and yet a priori, I should sooner expect they would produce them than any other. The term *Acrid-Narcotic* as employed by authors, has reference as much to such articles as *Veratrum viride*, *Sanguinaria vernalis*, etc. as to any other, in which an individual active proximate principle, as *Sanguinarina* or *Sanguinarine* for example, is at one and the same time acrid and as is supposed, *Narcotic*. But do *Veratrum viride* and *Sanguinaria* or the active proximate principle of the latter viz.: *Sanguinarina* or *Sanguinarine* (I do not pretend to say anything of the active proximate principle of the former, whatever it may be, for it has never been isolated, and therefore its nature and character, has never been determined) possess any true and genuine *Narcotic* power? Does either *Veratrum viride* or *Sanguinaria vernalis*, ever prove directly *Antirritant*, *Anodyne* or *Soporific*? Is not such an operation essential to a true and genuine *Narcotic*? Although I once entertained a different opinion, I believe, mainly on the ground of authority, yet I am now obliged

to doubt whether either *Veratrum viride* or *Sanguinaria vernalis*, or the active principle of the latter, ever prove directly Antirritant, Anodyne or Sporic. As now appears to me, their ultimate effects vary very considerably from the ultimate effects of the ordinary true and unequivocal Narcotics. But do they ever produce either of the sets of effects, which constitute the primary part of my definition of Erethistics; or even the set of effects which constitute the secondary part of my definition? At the time that my professional pupils and myself were investigating the powers, operations and effects of these agents, I had no very definite and precise ideas even of a Narcotic power, and much less of an Erethistic power; so that none of the observations made at that time, are now available towards settling the present question. But the term Acrid-Narcotic, I believe, is not infrequently applied to articles affording much less evidence of a true and genuine Narcotic power than *Sanguinaria vernalis* and *Veratrum viride*. Now the only doubt in regard to *Veratrum viride* and *Sanguinaria vernalis*, for which there seems to me to be the least shadow of ground, is whether they are Narcotics and Erethistics, or Erethistics merely. I have been in the habit of employing both of them ever since the summer of 1810 and I have never witnessed any thing like a direct Antirritant, Anodyne or Sporic effect from either of them; though I have often witnessed Erethism when they have been given in comparatively large doses, at short and regular intervals. For myself I have not the least doubt that they are Non-Narcotic Erethistics; and yet as some professional friends who even recognize the power that I call Erethistic, still insist that these articles are Narcotic instead of Erethistic, I am perfectly willing that my readers should have all the benefit of these doubts, thus having the question fairly brought before them. I have never seen any Spasms or Convulsions produced by *Veratrum viride* or *Sanguinaria vernalis*; nor have I ever known them destroy life; and with me there is as great a deficiency of definite and precise testimony upon these points, as of actual knowledge.

Are *Veratrum viride* and *Sanguinaria vernalis* ever capable of relieving the Acinesia, Pareses and Paralysis, Rheumatism and Neuralgia vera, or the chronic forms and stages of Rheumatism and Podagra? I have never known them employed in the Acinesia,

Pareses or Paralyzes, nor in Neuralgia vera, but in all the other diseases above mentioned they have a well established efficacy. As there is unquestionably a strong analogy between the Alcaloid now improperly called Veratrine, and the active proximate principle of *Veratrum viride*, as well as Sanguinarine (the principle difference consisting in the fact that the last two are entirely destitute of all Cathartic power, while the first is hydragogue Cathartic) I can not see any good reason why *Veratrum viride* and *Sanguinaria vernalis*, but much more especially their active proximate principles in a separate state, might not be serviceable in the Acinesia, Pareses and Paralyzes, and perhaps even in Neuralgia vera, if employed as is directed for what is called Veratrine, and for Delphinine. But I have never known them tried in these diseases.

If we should admit that *Veratrum viride* and *Sanguinaria vernalis* are Narcotics, it would not follow that *Lobelia inflata* is so likewise. The Erethistic power of this latter agent is materially different in quality from the Erethistic power of the former two articles, and is much more like the Erethistic power of the *Clematidæ*, *Anemoneæ*, etc. If I were to rank *Veratrum viride* and *Sanguinaria vernalis* with the Narcotics, I should not by any means associate *Lobelia inflata* with them. Its utter destitution of any thing even like a true Narcotic power will be shown when I come to treat of it individually. Though some varieties of Erethistic power may be and are commonly mistaken for a Narcotic power, yet some of them are so unlike, as never to be thus confounded with it, by any accurate observer at least. I feel absolutely certain that *Lobelia inflata* is not Narcotic; but if I mistake not, when administered in a comparatively large quantity in uniform doses, at regular and very short intervals, it is decidedly Erethistic.

I never happened to witness either Convulsions or death produced by either of these three articles; but if we may rely on very vague testimony, they extinguish life by occasioning extreme constitutional irritation and rapidly progressive exhaustion of the energies and powers of the nerves of chemical action, nutrition and reproduction. Such being the fact, I should think that if they ever produce Convulsions, they must be of the Clonic sort. When a strong predisposition to Hysterical Fit exists, and a large

quantity of *Lobelia inflata* is taken without producing vomiting, the *Lobelia* some times kindles into action both Hysterical Convulsions and Hysterical Delirium; but in this case, the *Lobelia* is by no means the essential cause, the *causa sine qua non*, the cause which determines the nature and character of the affection, but only a mere accidental and unessential cause which merely kindles into action whatever disease there is a strong predisposition to, without affecting or modifying its nature and character, even in the most trifling degree. In short, the *Lobelia*, under such circumstances, is a mere procatacetic cause, and nothing more. Such are not the Spasms or Convulsions, produced by it as an Erethistic, nor is there the least reason, as I believe, to think *Lobelia* is capable of proving an essential cause of any such affections.

TUBMA SEXTA.

ORÆESTHETICA ADENAGICA EMETICA.

CATHARTICA.

- ASAGRÆA OFFICINALIS (*Lindley*.)
- ?VERATRUM SABADILLA (*Retz.*)
- VERATRUM ALBUM (*Linn.*)
- { HELONIAS FRIGIDA (*Lindley*.)
- { *Veratrum frigidum* (*Schlechtendahl*.)
- DELPHINIUM STAPHISAGRIA (*Linn.*)
- ?HELLEBORUS ORIENTALIS (*Garsault*.)
- ?HELLEBORUS NIGER (*Linn.*)
- ?HELLEBORUS FÆTIDUS (*Linn.*)
- ?HELLEBORUS VIRIDIS (*Linn.*)
- COLCHICUM AUTUMNALE (*Linn.*)
- ?COLCHICUM VARIEGATUM (*Linn.*)
- COLCHICUM ILLYRICUM.

Lindley says that "*Asagræa officinalis*, an Alpine Mexican plant yields most of the *Cevadilla*, *Cebadilla* or *Sabadilla* seeds of commerce"—"now chiefly consumed in the preparation of *Veratrine*." (*Lindl. Veget. Kingd. Lond.* 1846, *Pg.* 199.) The term *Acrid Narcotic*, which commonly means *Erethistic*, is very generally applied to *Asagræa officinalis*; and indeed this article would seem to be considered as standing quite at the head of the

list of articles so called. Turnbull, without the least doubt or hesitation, considers Asagræa, and its active principle (which has unfortunately been named Veratrina or Veratrine, instead of Asagræina or Asagreïne) as decidedly belonging to this class of medicinal agents, a class for which he has no name, though his sole test of the propriety of such an arrangement, is the alleged fact that Asagræa produces the sensation of tingling, prickling, formication, numbness, etc. or in other words, a certain degree of stupor.

Lindley says of Veratrum Sabadilla that it "furnishes one" (sort or kind) "of the seeds" (called) "Sabadilla, Cebadilla or Cevadilla" (*Lindl. Flor. Med. Lond.* 1838 *Pg.* 586.) I have never yet succeeded in finding more than one sort of seeds under this name, though I have taken great pains for it. As I know no diagnostic between the seeds of Asagræa and Veratrum Sabadilla, I can not tell which plant produced those seeds that I have had; but I can not doubt that my specimens have been those, which yielded the Alcaloid called Veratrina or Veratrine. I should not think it at all probable that the seeds of two plants belonging to different genera could be so exactly alike as not to be easily distinguished. I therefore name Veratrum Sabadilla (Retz) in this turma or group, because Lindley says that it produces one sort of the seeds yielding Veratrina or Veratrine so called and for no other reason. If Veratrum Sabadilla does in fact produce any portion of the Sabadilla seeds of commerce; and if such portion of seeds really contains the Alcaloid Veratrine, Veratrum Sabadilla must necessarily be associated with Asagræa officinalis, into whatever class that may be put.

Of all the articles which I have just mentioned (with the exception perhaps of Asagræa officinalis, Veratrum Sabadilla and Delphinium Staphisagria, each decided to belong to this class by Turnbull) I wish to be considered as having some little doubt of the propriety of considering them as true and proper Erethistics of such a character as to entitle them to be associated with the articles just mentioned into one class. From this circumstance I purpose to discuss briefly their claims to such a location, and to mark several now associated with the three just excepted, with an interrogation and a doubt.

I am not sufficiently acquainted with Veratrum album practi-

cally, to be able to decide whether it is certainly entitled to admittance into this class or not. If it really contains the Alcaloid at present called Veratrine, it must be admitted of course. But I do not think that it has been shown with any certainty to contain this principle, or at least, I have never met with the evidence of it. If however we may take the testimony of authors of the *ateria medica*, which I am sorry to be obliged to say is not always very discriminating, I should think there could be no reasonable doubt that it is Erethistic, instead of Narcotic. So far as I have actually employed it, I have never seen a single symptom of genuine Narcosis produced by it. Turnbull says correctly that "the true nature of the Alcaloid afforded by *Veratrum album*, is still unknown, and that the Veratrine of commerce is obtained intirely from the seeds of *Sabadila*," i. e. *Asagrea officinalis*. *Veratrum album* and *Colchicum autumnale*, in the hands of Pelletier and Caventou, in 1819 afforded "a similar principle" to that obtained from *Asagrea officinalis*; but Geiger and Hesse have since shown that the principle obtained from *Colchicum autumnale*, "differs from" (what is now called) "Veratine, in several important particulars, and in consequence, they consider it a different and distinct principle, and have named it Colchicine. (*See A Turnbull, Med. Prop. Ranuncul. Lond. 1835 Introd. Pg. 8.*) I think that probability is against the opinion that Veratrine (now so called) is the active principle of *Veratrum album*. But whether it is or not, it is quite likely that it may be an Erethistic; and yet in the absence of absolute knowledge I prefer to put it down with a mark of interrogation and of doubt.

With the medicinal powers of *Helonias frigida*, I am acquainted only through testimony; and as this is not precise in relation to those points which determine its classification, I can only put it in this place from analogy.

As Colchicina or Colchicine, the active principle of *Colchicum autumnale*, has been isolated, and found to have such a near resemblance, in external and physical properties, to Veratrine, as to have been confounded with it, for a considerable time, I presume that *Colchicum autumnale*, and other species having the same active principle, must be Erethistic, though I have never witnessed any Erethistic operation from it; and certainly have never witnessed any Narcotic effects. The truth is that its Aden-

agic, evacuant and exhausting powers are so intense, that it is seldom pushed to the extent to produce Erethistic effects. I can not say that I ever witnessed any Oresthetic effects from Colchicum any more than I have witnessed Erethistic effects, I suppose for the same reason. But if we do not employ Colchicum for its Erethistic effects, it may perhaps be inquired why it should be classified by them; to which I reply that as we have a class founded on this power, and as this article doubtless possesses it, it should therefore be mentioned here, just as Alcohol is always mentioned among the Narcotics, though we never employ it in medicine for this purpose. But of course, Colchicum will be mentioned again among the Adenagics, since we use it mainly for its Adenagic effects. I have just referred to the exhausting power of Colchicum. This however as possessed by this agent is not a medicinal operation, and therefore it can not be classified by it. Although it is extremely exhausting, I do not know that it is Antiphlogistic. It is however, highly important for practical purposes, to be aware of the full extent of this exhausting operation.

Turnbull mentions Delphinium Staphisagria as an article which decidedly produces the effects specified in the secondary part of my definition, and it is certainly one of these articles which is commonly called an Acrid-Narcotic. I put it down therefore in my catalogue of Erethistics. I must add however that I have no knowledge of any Ultimate-Erethistic powers in this article from my own experience. I have never been able to obtain the seeds for use in medicine. Since its active principle, viz. the Alcaloid Delphinine has been obtained I have repeatedly employed that agent; but I never had occasion to push it to such an extent as to produce any obvious Ultimate-Erethistic effects. I have always employed it for some of its other powers. Turnbull says of the Alcaloid Delphinine that "when taken to the extent of a few grains, it gives rise to sensations of heat and tingling in various parts of the body, similar to those which are produced by rubbing it upon the skin; and its other effects are nearly the same as those of the salts of Veratrine." He adds that "the salts of Delphinine act much in the same manner, and there is nothing to give them a preference to the uncombined Alcaloid." "Both have been used in the same diseases as the preparations of Veratrine, and appear to exercise a similar action," etc. (*Ibid.* Pg.

114.) Again Turnbull says "Delphinine gives rise to a sensation of burning, not unlike that which manifests itself a short time after the application of a vesicatory, but not to an unpleasant degree." This effect is produced by external application. "In almost every case" (says Turnbull) "a blush pervades the surface over which Delphinine has been rubbed, and this continues for a length of time, varying from a few minutes, to an hour or two; but in no instance, as yet observed, has it gone on to" (vesication or as it is commonly called) "eruption" "The effects produced by Delphinine are in general more powerful, and more durable, than those produced by Veratrine." (*Ibid.* Pg. 116.) This latter statement proves Oresthetic rather than Erethistic powers. Delphinium Staphisagria is represented as being efficacious for the relief of most of the diseases to which the Erethistics are adapted. If it is active either in this or any other way, and it is certainly active in other ways, I doubt not that other species of the genus possess similar, indeed the same powers; but in the absence of actual and positive knowledge upon the subject, I shall omit to mention any other species.

Several of the species of the genus *Helleborus* are constantly mentioned by authors as Acrid-Narcotics. I have often prescribed *Helleborus niger*, such as it is found in our shops, but with very little, if any effect. But I suppose there is no room to question the activity of this article, if it is collected, dried and preserved with proper care and skill, and used before it has lost its powers from age and exposure. Their Narcotic power, if it is really such, is certainly not of the Sedative and Soporific sort, and judging from testimony (which it is true, is ever liable to be fallacious, when it relates to ill understood subjects) and also from botanical affinities, I should think it quite probable that these agents too, might be Erethistic, though I do not absolutely know this. I have therefore put them down with a mark of interrogation and doubt.

Authors very often indeed mention what they call Acrid-Narcotics. So far as I understand what they intend by this compound term, it is supposed to imply what they imagine to be a true and genuine Narcotic, which, in consequence (as they appear to think) of its containing an acrid principle is thereby prevented from producing any Sedative effects, such as an Antirritant, An-

odyne or a Soporific effect. The opinion implied in this definition is incorrect, since no conjunction of any acrid principle known, is capable of preventing any truly Sedative and Soporific-Narcotic from producing either its Antirritant, its Anodyne, or its Soporific effects. It is true that the conjunction of Acrids with Sedative and Soporific-Narcotics, will enable a patient to take somewhat more of them without Ultimate-Narcosis, than he could otherwise do; and this is all. Such a conjunction of Acrids with truly Sedative and Soporific-Narcotics is utterly incapable of preventing their regular and natural effects, provided they are given in sufficient quantities. What then are the articles whose operation and effects are supposed to correspond to the definition just given of an Acrid-Narcotic? Perhaps they may be in some instances truly Sedative and Soporific-Narcotics that happen to have an acrid principle associated with the Narcotic principle in one and the same individual plant. I have never sufficiently investigated how many such cases there may be, but I do not now recollect any. Perhaps all the Non-Sedative and Non-Soporific articles that are commonly called Acrid-Narcotics, may in fact be Erethistics, without any true and genuine Narcotic power. As *Asagræa officinalis* and *Delphinium Staphisagria* have been decided by Turnbull, to possess the power now under consideration; and as a large number of the Acrid-Narcotics (so called) are so strikingly analogous to these two articles, the question of their really possessing Erethistic, instead of true and proper Narcotic power, ought to be investigated and decided; and therefore I have enumerated a few of them with a mark of interrogation and doubt, and especially such as appear to have the greatest resemblance to *Asagræa officinalis* and *Delphinium Staphisagria*.

And now will these agents contribute to relieve lesions of function of the nervous system generally, or of any of its subordinate parts? Will they contribute to relieve *Acinesis* and *Paresis* i. e. imperfect or incomplete Paralyzes? Will they contribute to relieve perfect Paralyzes? Will they contribute to relieve *Rheumatalgia*? Will they contribute to relieve *Chronic Rheumatismus*? Will they contribute to relieve inveterate and protracted *Podagra*? If they will accomplish all this, the next inquiry must be after the power, by which they accomplish it. It can not be by their Oresthetic or Epispastic power, for they do not possess

a sufficient degree of it. It can not be by their Adenagic power, for that power exerts no influence upon Acinesis and Pareses or Paralysis; upon Rheumatalgia or Neuralgia vera; whatever influence it may have upon Chronic Rheumatismus, or inveterate and protracted Podagra. It can not be by an Emetic or a Cathartic power, when the article happens to possess one or both of these powers, because it is as well determined as anything in medicine, that neither of these powers will relieve the diseases in question. If the preceding is true, the effects in question must be produced by that power, which hitherto has been called Acrid-Narcotic; and now, how much, and in what respects must an Acrid-Narcotic power differ from an ordinary Narcotic power, to be capable of operating in a manner so essentially different? If the difference is wide and prominent, it ought undoubtedly to constitute the foundation of a new class; for nothing but error and mischief can possibly result in medicine, from confounding together very unlike things.

II. ERETHISTICA NON-TORPENTIA
Non-benumbing Erethistics.

TURMA SEPTIMA.

ADENAGICA

- CIMICIFUGA FOETIDA (*Linn.*)
BOTROPHIS ACTÆOIDES (*Fisher & Meyer.*)
ACTÆA SPICATA (*Linn.*)
ACTÆA BRACHIPETALA (*De Cand.*)
ACTÆA PACHYPODA (*Elliott.*)

These are the species of the Linnean genus *Actæa* which have hitherto been employed in medicine. From my own observations I know that *Botrophis Actæoides* is considerably more active than *Actæa brachypetala* and *Actæa pachypoda*. *Cimicifuga foetida* is said by some, to be the most active species of the Linnean genus *Actæa*; but it may well be doubted whether this opinion is founded on the results of thorough and fair comparative trial. *Actæa spicata* is commonly represented as very active; but on what ground does not appear. I have made many endeavors to obtain it for trial, but always without success. DeCandolle says of his and the Linnean genus *Actæa*, which comprises Trautvet-

teria, Cimicifuga, Botrophis and Actæa "Radices drasticæ, sub-venenatæ; herbæ suspectæ." (*De Cand. Reg. Veg. Syst. Nat. Vol. primi. Pg. 381 Parisiis. 1813.*) As I suppose that the term drastic means merely and simply *acting powerfully*, this statement amounts to an opinion that the whole Linnean genus is so active as to be attended with some hazard to life when used freely and incautiously.*

* As the whole number of species, that would be comprised in the Linnean genus Actæa, if they were still kept together, is only twelve or thirteen. I shall enumerate the whole at present known, distributing them into the four genera that are now adopted by some of the best botanists. The following then is a synopsis of the genera that have been formed from the Linnean genus Actæa, with their several species, and their synonymy, mainly derived from DeCandolle's Prodrômus, and Torrey's and Gray's Flora of North America.

CIMICIFUGA.

- 1 { CIMICIFUGA FÆTIDA (Linn.)
 Macrotris fætida (Eaton.)
 Actæa Cimicifuga (Linn.)
 Actæa racemosa (Gencrsich.)
 Thalictroides fætidissimum (Ammann.)
- 2 { CIMICIFUGA SIMPLEX (Wormskiold.)
 Actæa simplex (De Cand.)
 An varietas precedentis? (De Cand.)
 An species propria? (De Cand.)
- 3 { CIMICIFUGA AMERICANA (Michaux.)
 Cimicifuga podocarpa (Elliott.)
 Actæa pentacarpa (Michaux.)
 Actæa podocarpa (Delessert & De Cand.)
- 4 { CIMICIFUGA CORDIFOLIA (Pursh.)
 Cimicifuga Americana (Muhlenberg.)
 Actæa cordifolia (De Cand.)
- 5 { CIMICIFUGA ELATA (Nuttall.)
 Cimicifuga fætida (Pursh.)

TRAUTVETTERIA.

- 1 { TRAUTVETTERIA PALMATA (Fisher & Meyer.)
 Cimicifuga palmata (Michaux.)
 Actæa palmata (De Candolle.)
 Actæa racemosa (Walter Herbar.)
 Thalictrum Ranunculinum (Muhlenberg.)
 Hydrastis Carolinensis (Walter.)
 Hydrastis Canadensis (Poiret.)
 Hydrastis ——— (LaMarck.)
- 2 { TRAUTVETTERIA GRANDIS (Nuttall.)
 Cimicifuga palmata (Hooker.)

Cimicifuga, Botrophis, and Actæa (so far as my observation extends) are as incapable of producing any direct Sedative or stupefying effects, as is the fact with Ignatia and the five Erethistic Strychni; and they also appear to be as positively, if not as intensely rousing. As appears to me, they produce very decidedly (though in a less degree than Ignatia and the five Erethistic

BOTROPHIS.*

- 1 { BOTROPHIS ACTÆOIDES (Fisher & Meyer.)
Botrophis Serpentaria (Rafinesque.)
Macrotrys Actæoides (Rafinesque.)
Macrotrys racemosa (Eaton.)
Cimicifuga Serpentaria (Pursh.)
Cimicifuga racemosa (Elliott.)
Actæa racemosa (Linn.)
Actæa monogyna (Walter.)
Christophoriana Americana, etc. (Dillen.)
- 2 { ?BOTROPHIS JAPONICA.
? *Macrotris Japonica*.
? *Cimicifuga Japonica*.
? *Actæa Japonica* (Thunberg.)

ACTÆA

vel

CHRISTOPHORIANA.

- 1 { ACTÆA SPICATA (Linn.)
Actæa spicata var. *nigra* (Willdenow.)
Nepellus racemosus (Dalich.)
Aconitum racemosum (C. Bauhin.)
Aconitum bacciferum (J? Bauhin.)
Christophoriana spicata (Moench.)

*The generic name Actinospora, I believe, has been applied either to Botrophis or Cimicifuga, or to some portion of one or the other. In this application, this name is credited to Fisher and Meyer by Torrey and Gray. A genus Actinospora is retained by Lindley under the Actææ, in addition to Trautvetteria, Cimicifuga, Botrophis and Actæa. — In this application, this genus is credited to Turczaninow by Lindley. What it comprises I know not. The foundation for the genus Botrophis or Macrotrys has been questioned even by those who admit Trautvetteria and Cimicifuga. It has always appeared to me that there is full as good ground for distinguishing Botrophis or Macrotrys from Cimicifuga, as there is for dividing the Linnean genus Actæa in any way. American botanists have been obstinate in leaving out the letter *r* from the last syllable of the name *Macrotrys*, though this is an error. This name is compounded of the Greek attribute signifying *large*, and the last syllable of the Greek noun-substantive for raceme, so that with the *r* omitted the name does not retain the syllable in question. This name should have been Macrobotrys—Botrophis is made up of this same Greek term for raceme and the Greek noun-substantive for snake or serpent, so that Macrotrys or Macrobotrys signifies large raceme, and Botrophis signifies snake raceme

Strychni) the effects specified in the primary part of my definition of Erethistics. I do not know that Cimicifuga, Botrophis and Actæa ever produce any very positive stupor of the extremities i. e. the tingling and prickling numbness, formication, etc. which is so frequently an ultimate effect of Ignatia, the five Erethistic Strychni, and of the Aconita. Perhaps I may never have seen them pushed far enough for this effect. Great restlessness and jactitation, violent neuralgic pains, and what is often called, rather quaintly "tumultuous action of the heart and arteries," have always been a prominent part of the ultimate effects of Cimicifuga, Botrophis and Actæa, at least so far as my observations extend. What sort of Spasms or Convulsions they might produce I know not from personal observation, never having seen them pushed to such an extent; but in a few cases, where I have had opportunity to see some thing of their ultimate effects, cases in which I considered the patient as upon the borders of Spasms or Convulsions, it appeared to me that tonic but not Tetanic Spasms or Convulsions were more threatened than any other sort. It appears to me as Botrophis Actæoides is capable of proving Ecbole, Ectrotic, Oxytocic, Abortifacient, Parturifacient or Partus-accelerant (or any thing else, that any one may choose to call this operation) it ought to produce Spasms or Convulsions of the common or subtonic sort. Are the strongly threatened Spasms or Convulsions i. e. Spasms or Convulsions of the common sort any thing more

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- 2 { ACTÆA BRACHYPETALA.
 Actæa brachypetala var. *rubra* (De Cand.)
 Actæa Americana var. *rubra* (Pursh.)
 Actæa spicata var. *rubra* (Michaux.)
 Actæa rubra (Bigelow.)

- 3 { ACTÆA PACHYPODA (Elliott.)
 Actæa brachypetala var. *alba*. (De Cand.)
 Actæa Americana var. *alba*. (Pursh.)
 Actæa spicata var. *alba*. (Michaux.)
 Actæa alba (Miller & Bigelow.)*

- 4 ACTÆA ARGUTA (Nuttall.)

*As will be observed, DeCandolle erroneously considers the last two species as new varieties of one single species, and he reckons two other supposed varieties, viz. var. *corulea*, which is believed to be identical with, or perhaps a slight variety of *Actæa brachypetala*, and var. *microcarpa* which is believed to be identical with, or perhaps a slight variety of *Actæa pachypoda*.

than a variety of tonic or Tetanic Spasms? Long ago, I came to the conclusion that they are not, and so I have considered them in what precedes.

I have never known *Cimicifuga* *Botrophis* or *Actæa*, employed in unequivocal and acknowledged Paralysis, and therefore I know not whether they are capable of rendering any service or not; but they are of decided efficacy for the relief of certain Paretic diseases, such for example as one of the sets of cases (the most common I think) which are called Chorea. This disease, though commonly considered as spastic, is most certainly and assuredly Paretic. It is a fact well known to many that *Cimicifuga*, *Botrophis* and *Actæa* are quite valuable for the treatment of Rheumat-lagia which is always more or less Paretic. In Neuralgia vera I have never known them employed, and consequently can say nothing about these effects in that disease, but I think it more than probable, that they would be more or less useful.

As to Rheumatismus chronicus, and inveterate and protracted Podagra, I very well know that they are capable of rendering more or less service in both; provided the medicine is of the best quality and is administered with sufficient freedom and perseverance. In these last two diseases only can they be supposed to be beneficial by any other power than that commonly called Acid-Narcotic or as I suppose it should be called Erethistic. Their other power viz. that of an Adenagic might possibly benefit these diseases, and yet far more efficient Adenagics entirely fail of rendering any service, when these agents are decidedly useful. As to what I formerly considered to be the Sub-Euphrenic power of these articles, I am now well satisfied that it was part and parcel of what I now believe to be their Erethistic power, but which I could not consider as a part of their supposed Narcotic power. If these articles are Erethistic; and if any of those which immediately follow are so likewise, these may be considered as standing precisely in the same relation, as respects affinity and analogy of power, to those which immediately follow, as *Ignatia* and the five Erethistic *Strychni* stand in, to those which immediately follow them.

Upon the whole I can not doubt that *Cimicifuga*, *Botrophis*, and *Actæa* are true Erethistics, and not Narcotics, if the production of the effects specified in the primary part of my definition,

without those of the secondary part will constitute an article an Erethistic, as I have already concluded (perhaps wrongly, though I think not) that it will.

TURMA OCTAVA.

ORÆSTHETICA ADENAGICA?

PULSATILLA VULGARIS (*Spreng.*)

?ANEMONE CORONARIA (*Linn.*)

{ ?ANEMONE STELLATA (*LaMarck.*)

{ *Anemone hortensis* (*Linn.*)

Perhaps the medicinal species of the genus Pulsatilla, which, I believe, have been reputed by some to be Narcotics of a Non-Sedative and Non-Stupefying character, may in fact be Erethistics, after the manner of the Aconita. But I have never investigated this subject, and I do not find such testimony on record as can at all be considered as any way decisive. It is worthy of inquiry whether some of the medicinal species of Anemone may not also be in reality Erethistic after the manner of the Aconita. I am strongly inclined to think that they are; but I have no certain knowledge on the subject. These articles, in excessive quantities, are certainly capable of producing constitutional irritation with jactitation; and I doubt not that if pushed to a sufficient extent, they would also occasion rapidly progressive exhaustion of the powers and energies of the nerve of chymical action nutrition and reproduction.

CLEMATIS CRISPA (*Bot. Mag.*)

CLEMATIS ERECTA (*Allioni.*)

CLEMATIS MAURITIANA (*LaMarck.*)

CLEMATIS VIORNA (*Linn.*)

CLEMATIS VIRGINIANA (*Linn.*)

CLEMATIS VITALBA (*Linn.*)

CLEMATIS FLAMMULA (*Linn.*)

Some author (I do not now recollect whom, and therefore am unable to make reference to him) mentions that the medicinal Clematides, when taken internally with considerable freedom, produce the effects specified in the secondary part of my definition of Erethistics; and this author adds, that when they are taken to such an extent as to endanger or destroy life, they do this by a peculiar operation upon the nervous system, which, he supposes has some

similarity to, or analogy with a Narcotic operation. If there is no mistake in this statement the Clematides are probably Erethistic in a manner similar to *Arnica montana*, or even the *Aconita*. From the slight degree of their ultimate effects which I suppose that I have occasionally seen, it is my belief that the phenomena that attend the extinction of life, by this group of agents, are great constitutional irritation, with uncontrollable jactitation, and rapidly progressive exhaustion of the powers and energies of the nerve of chymical action, nutrition and reproduction. Most authors however treat of the Clematides as simple and mere Acrids, from which I should infer that they are nothing but pure Oresthetics. They have been highly recommended in Acinesis, Pareses and Paralyzes, and also in Rheumatism. But they might benefit these diseases, by their acrimony, and their consequent Oresthetic power. I have never heard of their use in Neuralgia vera. I doubt not that as Acrids and Oresthetics they might benefit Chronic Rheumatism, and obstinate and protracted Podagra, as well as by an Erethistic power. I do not recollect however that they are recommended or used in such cases. It appears to me to be quite probable that the medicinal Clematides may be Erethistic after the same manner as the *Aconita*; but the probability of this is not by any means so great as that *Arnica montana* is so. They seem to me to be certainly Oresthetic; but if they are Erethistic, I should think they must be so independent of their Oresthetic power. They seem to me too, to be more or less Adenagic; but if they are Erethistic, I should think they must be so independent of their Adenagic power. Upon the whole it would seem (if we may trust authorities) that they produce effects, which it is difficult to explain by their Oresthetic and Adenagic powers merely. But I know of no positive proof that they are Erethistic after the manner of the *Aconita*, and I mention the matter, in the hope that such mention may lead to investigation of the facts of the case which I have never made.

?*DAPHNE MEZEREUM* (Linn.)

?*DAPHNE LAUREOLA* (Linn.)

?*DAPHNE GNIDIUM* (Linn.)

?*DAPHNE CNEORUM* (Linn.)

?*DAPHNE ALPINA* (Linn.)

?*DAPHNE THYMELÆA* (Linn.)

?DAPHNE TARTON-RAIRA (*Linn.*)?DIRCA PALUSTRIS (*Linn.*)

If the Clematides should prove Erethistic after the manner of the Aconita, it is not improbable that the medicinal species of the genus Daphne may prove to be so likewise; and also Dirca palustris; but I think that Daphne and Dirca are less likely to be Erethistic after the manner of the Aconita than the Clematides are. When they have been taken to such an extent as to destroy life, they have been said to produce symptoms like those that are produced by the Acrid-Narcotics. A priori, I should consider this as improbable. Admitting that there is no fallacy of any sort, about this supposed fact, the several medicinal species of Daphne are doubtless Erethistic. But the matter requires much more investigation, before it can be considered as well settled. The late Dr. Nathan Smith (then of Dartmouth College) once informed me that he had been called to see a boy, who had swallowed so many of the seeds of Dirca palustris as to produce violent and dangerous effects. He described the symptoms as such as might be expected to result from a large quantity of Datura accompanied by a very intense acrid. So far as this case affords indications of the true powers of this article, it contributes to show that it is truly Erethistic; and again so far as we can judge from the very near botanical affinity of Dirca with Daphne, it may be considered as favoring the opinion that the latter is Erethistic also. But I insist that we should have better evidence, before we yield our faith in medicine.

The powers of the Essential Oils seem never to have been investigated. Physicians seem to have been contented with calling them by that vaguest and loosest of all the terms in the materia medica, viz. Stimulant, and with using them as mere flavoring articles. It is my opinion that valuable powers are yet to be discovered in this group of agents, by which I mean merely liquid compound radicals of H. C. Many of them I know to be Euphrenics; and I think it quite probable that the whole are so, in a greater or less degree. In the present state of my knowledge, I am inclined to think that this will yet turn out to be their most prominent power. But I should not mention them in this place, if this were all. I think that a considerable number of them are Erethistic. I believe that I have often seen moderate Erethistic

effects from some of them; and if we may rely on testimony, all that have been known to destroy life, have done it after the manner of a large portion of the Erethistics, viz. with the phenomena of constitutional irritation, jacitation, and rapidly progressive exhaustion of the powers and energies of the nerve of chymical action, nutrition and reproduction. But I do not know enough of the Erethistic Essential Oils to pretend to give a catalogue of them in this place. I shall hereafter enumerate some of them, in the class Euphrænica.

Perhaps some of the *Ætheres* will yet prove to be Erethistics. A single *Æther*, viz. the Oxyspirhylate of Protoxyd of Methygen, commonly called Essential Oil of Gaultheria procumbens destroys life after the manner of the Erethistics, or at least, after the manner of a great portion of them, and if testimony may be confided in, it produces other effects of the Erethistics. I think we may take it for granted that this is not a solitary case. Other *Ætheres* are reported to have produced effects indicative of an Erethistic power. However I mention this *Ætheres* only as an example. I know too little of the Erethistic power of the *Ætheres* to say any thing more of them in this place.

PROËM TO THE CLASS EUPHRÆNICA.

There is a Greek noun-substantive, whose etymological signification is said to be "*attolli solitum*." It was the original name of the diaphragm, to which its signification is sufficiently appropriate. After this muscle came to be esteemed the seat and organ of the mind and affections; (as it was at one time) its name was transferred to the mind and affections; and it is now the established Greek term for them. From this term, with a prefix denoting "*bene*" was formed one verb signifying *to talk well; to talk cheerfully or exhilaratingly, &c.*; and another verb *to think well; to exhilarate; &c.* From these two Greek verbs having a common origin, I derive my terms in application to the power, operations and effects of the class of remedies, of which I am now about to treat. Euphrænica I derive directly from the last mentioned verb; and of course, it signifies articles which exhilarate, this usually

being a prominent part of their operation. It is not to be expected that a single term should imply the whole definition of a class of medicines. The term Euphrantica, perhaps more correctly formed than my term, and with the same signification, is ancient and classical; but I did not like it. It is quite possible that this term is really preferable to my own. Any one who prefers it can of course employ it.

There was more difficulty in obtaining a suitable name for the operations and effects of this class of agents, than for the class itself. Euphrone, is a classical Greek noun-substantive regularly derived from the last mentioned verb, and of course having the right etymological signification; but unfortunately it is used only by the poets, in the sense of night, because night is supposed to be favorable to good thinking. I am forced therefore to reject this term wholly. Euphrœnia likewise I derive directly from the last mentioned verb and I like it as more congruous with Euphrœnica than any other term, and therefore I shall use it, though not to the exclusion of the term Euphrasia. Euphrasia is an ancient and classical term, which though derived from the first of the two verbs that I have mentioned, yet signifies cheerfulness; good humor; joy; gaiety; exhilaration; etc. This term I have often used to denote the effects of a Euphrenic, and shall probably continue to use it, though not to the exclusion of Euphrœnia.

Definition.—The Euphrenics, *in the first grade of their operation*, obviate languor and lassitude when it exists; *in the second grade of their operation*, they produce a peculiar calm placid and pleasant sensation state or condition; *in the third grade of their operation*, they occasion a peculiar, rather agreeable and apparently non-exhausting preternatural wakefulness; *in the fourth grade of their operation*, they produce a greater or less degree of positive exhilaration, which, by some articles, may be increased to such a degree that the actions of the subject are not under the control of his will, and perhaps it amounts to actual delirium; *in the fifth grade of their operation*, they occasion a peculiar suspension of the functions of the hemispheres of the cerebrum, and an Anæsthesia or destitution of common sensation or a state of insensibility to pain, some times with a complete loss of consciousness, and occasionally with a moderate degree of it. The sixth or last grade of the operation of this class of agents, i. e. the manner in which they destroy life, is unknown to me.

The pure Euphrenics produce all the operations and effects specified in the definition, without either increase or diminution of vital energy and strength of action in the heart and arteries, and without any of the effects which constitute either Proximate or Ultimate-Narcosis. If none of the Euphrenics produced any effect beyond the first grade of their operation (which may possibly be the fact as respects some of the feeblest articles of the class,) still they would be highly useful agents, and would doubtless be much valued and sought-after. If to this however, we add the second grade of their operation, which is about the extent of the effects for which the great body of the Euphrenics in common use are habitually taken, there seems to be no ground for wonder that almost the whole world seeks for, and employs them. The third grade of their operation would seem, at first view, to be an undesirable effect; and yet, when pushed to this extent, the first two grades are exerted in a so much more intense degree, as to do much more than compensate for the deficiency of sleep, at least for a considerable period of time, exactly how long, I am unable to conjecture. Hereafter I shall quote a considerable amount of important testimony, from good authorities upon this very point. The peculiar effects that constitute the fourth grade of their operation, are in themselves of little value; but when any agent is pushed to the production of this particular operation, we obtain the very highest degree of the first two grades of effect, which after all, are altogether the most useful of the operations of the Euphrenics.

The fifth grade of their operation, is supposed by some to be a very recent discovery; but this is assuredly a mistake. I arrived at the conclusion that it was a regular grade of the operation of a peculiar class of remedial agents, some where between 1822 and 1828. That it was a regular effect of the *Ætheres* I learned at the commencement of my professional pupillage in 1807, from gentlemen who were then elderly practitioners, none of whom claimed it as their own discovery, but professed to have received the facts traditionally from their seniors. Although these gentlemen very well knew that patients suffered no pain from severe injuries, while under a certain grade of the influence of the *Ætheres*, yet they deemed it unsafe, indeed highly dangerous to produce this grade of influence by these agents. The medical

students however with whom I was associated in my studies were in the habit of pushing, not only the *Ætheres*, but also the Protoxyd of Nitrogen to this grade of effect, and that very frequently, and with perfect impunity. I continued to have opportunity to witness this grade of the operation of these agents, not only after I became a practitioner of medicine, but the whole of the time that I was an instructor in a medical school, which was about sixteen years in one institution and fourteen in another. For the whole of this time, the medical students of the institutions, with which I was connected, were in the habit of inhaling the *Ætheres*, mainly for the exhilarant grade of their operation; but they often pushed them to the Anæsthetic grade. This was done as mere matter of amusement; but as the practice was some times followed by the students of the academical department, it produced great annoyance to the faculty of that branch of the institution. More than once a small company was associated for the purpose of making regular experiments with the *Ætheres*. One of these companies took Tritochlorid of Formicigen or Chloroform into the stomach to such an extent as to produce perfect Anæsthesia; and did not recover perfectly from the exhausting effects of it, till after three or four months.

In the course of this time I carefully investigated the laws of the whole operation of a considerable number of the Euphrenics besides the *Ætheres*, but saw no ill effects from any of these, pushed even to the Anæsthetic grade of their operation, except from Tritochlorid of Formicigen. All the *Ætheres* (except Alcohol) at least all that I tried, I found to be more or less exhausting, but not sufficiently so to do mischief, when used for the production of Anæsthesia. But the Tritochlorid of Formicigen, when used so as to produce any considerable effect, invariably did more or less mischief, and this by the degree of its exhausting operation, an effect quite independent of its Euphrenic operation.

As soon as I had investigated this subject of the Euphrenics to a certain extent, I became satisfied that the Scandinavian Berserkers, or their ministers of religion, under whose guidance they acted, must have been in the possession, and in the habit of using some very active Euphrenic; and such I think, has been fairly shown to be the fact. All the discovery in relation to this subject, that has been made in recent times, is the fact that An-

æsthesia may be produced and kept up by Protoxyd of Nitrogen, Protoxyd of Etherogen or Common Æther, Sulphi carbonic Acid, etc. for a sufficient length of time to perform all common surgical operations without pain, and this with impunity to the patient. It has likewise been discovered, in very recent times, that Trichlorid of Formicigen, or Chloroform, though an unsafe article, may nevertheless be used for the same purpose, in very many instances, without killing the patient. I do not by any means undervalue this knowledge; I only mention it as all that is new upon the subject. I believe that there is ample evidence before the public, that the Chinese were in the habit of performing surgical operations upon patients under Anæsthesia, perhaps before the Christian Era; but this, I believe, was entirely unknown to the European and United States Surgeons, when the custom of operating upon patients under the Anæsthesia of one or the other of the articles just mentioned was begun.

As important however as the Anæsthetic grade of the operation of the Euphrenics has lately been esteemed, for the purpose of performing surgical operations without pain, still I consider the first two grades of the operation of this class of agents as of far more consequence to the welfare of man, on account of the extreme frequency of their application, and the great value of their analeptic and restorative operation. Coarse and disgusting as are the necessary attendents upon the habitual use of Tobacco, and wholly unnecessary as it is to very many who employ it in this way; still I think there can be no doubt that the aggregate of benefit it has rendered, by the production of the first two grades of a Euphrenic operation, in subjects that have truly needed the effects in question, is far greater than the aggregate of benefit that will ever result from the use of the Euphrenics for the production of Anæsthesia during surgical operations. I know of no morbid effects, which Tobacco, as ordinarily used, produces, except a moderate variety of Limosis Syncoptica, in consequence of which one who has long used Tobacco habitually, is quite uneasy without it. It is subject to no such abuses as Wine and Alcohol are so exceedingly liable to. But it should be added that a far better article should always be chosen, one which is capable of producing all the useful effects of Tobacco, without any of its disgusting accompaniments, which very certainly may be easily done. Next

after food, the Euphrenics are truly the most important agents in common use, by the human race, since they contribute so powerfully to diminish and obviate the wearing and exhausting effects of the toil, fatigue, cares and anxieties of life, and also operate quite efficiently, not only to ward off and prevent disease, but in fact also to prolong life.

It is not a little remarkable that we are intirely ignorant of the origin of the popular use of almost every one of the Euphrenics, which are thus employed; and they are legion, for there is probably not a nation or people under the sun, that does not use some one or more of them. Wine must have been used before the Flood, no body can even conjecture how long, since Noah was acquainted with it, and set about its preparation not long after leaving the Ark. A preparation of the Poppy is believed to have been made anciently for popular, or at least non-medical use, near the temple of Jupiter Ammon in Upper Egypt or the Thebaid, and thence some times called Thebaicum. This was in use beyond all history or tradition. It is supposed by some, that this was the substance called Nepenthe by Homer, which Hellen gave to the guests of Menelaus to drive away care and to produce hilarity. It is proper however to state that some suppose the article used by Hellen must have been Hemp; while others translate the passage in such a manner that it does not seem to refer to any particular and specific article. But however this may be, I believe that the Poppy was in use as a popular Euphrenic long before it was employed in medicine, and that the origin of this use is lost in the obscurity of antiquity.

When Europeans first visited China, Tea was used just as it is at present, and no one can tell when it was otherwise. It would seem that Coffee and Catha were employed just as they are now in the Highlands of Abyssinia long before they were introduced into Arabia—how long can not even be conjectured. *Nicotiana Tabacum* and *N. rustica* were in use by the Aborigines of America when Columbus first reached the country, and were alleged to have been always in use among them. *Nicotiana Sinensis* had been in popular use, no body knows how long, in Eastern Asia before Europeans were in the habit of visiting that region. *Nicotiana fruticosa* had been in popular use time immemorial among the inhabitants of the great South Cape of Africa, when Euro-

peans first acquired a knowledge of them. *Nicotiana Persica* had been in popular use in Persia past the memory of man, when the moderns first had accurate knowledge of that country. When the Angli-Saxon inhabitants of the U. S. A. first became acquainted with the North-Western tribes of the Aborigines they found *Nicotiana quadrivalvis* in popular use among the Mandans, a small tribe which has since become extinct by means of *Variola*. They could give no account of the origin or beginning of its use. They employed no other species of this genus.

Bang or Hashish has been in popular use in India and Arabia past all history or tradition; and the Arabs have carried it with them where ever they have migrated. Coca has been used time immemorial by the Autochthones of the Western Andes, when that region was first visited by Europeans. Guaranà and Matè had been in use beyond the memory of man on the Eastern side of the Andes. Yaupon or Cassena was in use by the Aborigines of the Southern U. S. A. when they were first visited by people from the Eastern Continent. The Moucho-moro was employed by the original Siberians, i. e. the Hyperboreans, from the remotest times, no body can tell how long. The same, I suppose, would probably prove to be the fact, if suitable inquiry were to be made in regard to nearly all of Morewood's 732 octavo pages of these agents.

Much wonder has often been expressed that articles with such ill flavors as most of the Euphrenics possess, should ever have become so necessary for comfort as these articles so often are. There is however, no real mystery about this matter, if we consider that they are taken for their operation and effects; and not for their tastes. It is quite certain that a man may have sufficient motives for taking an article not at all pleasing to the palate. This seems to be intirely forgotten by the wonder-finders. Again, great surprise is often expressed at what is considered the force of mere habit in relation to these agents; though in truth genuine habit has no connexion at all with the matter. The stated use of certain quantities of the Euphrenics, for a certain length of time produces what may correctly be considered as a true and proper pathological condition, which I have long been in the habit of calling *Limosis Syncoptica*. It is the law of this condition that so long as the patient is under the influence of a certain relative

amount of the Euphrenic that produced the condition in question, he is comfortable; but when such influence intirely ceases, he is miserable, and really a fit subject for medical treatment. Assuredly this is very little like habit. I never could discover how such a delusion should have continued so long.

Some suppose that the power of producing a suspension of the functions of the hemispheres of the cerebrum, and this alone, is sufficient evidence that an article is a Narcotic. They would therefore exclude from this class every article that will accomplish this, which would bring into the class of Narcotics a large group of articles exerting no other operation belonging to that class. If the Narcotics and the Euphrenics are carefully discriminated however, it will be found that the quality and character of the suspension of the functions of the hemispheres of the cerebrum, as produced by the two classes respectively, is materially and essentially different, at least so far as our present knowledge extends. This view would exclude all the feeble Euphrenics, and all the feeble Narcotics, and would associate numerous articles that have no sort of agreement, except in this single particular. Upon this plan, Cyanid of Hydrogen, Gelseminum nitidum, Amianthium muscitoxicum, Cicuta maculata, etc. are to be associated with Protoxyd of Nitrogen and Protoxyd of Etherogen. But what is to be done with all those Euphrenics which are capable of producing the first four grades of a Euphrenic operation, but are not quite active enough to be capable of producing the fifth grade; what is to be done with those Narcotics which are capable of producing all the medicinal grades of a Narcotic operation, and some Ultimate-Narcotic effects, and yet are not quite active enough to be capable of producing coma, or any other suspension of the functions of the hemispheres of the cerebrum? There are very many such articles. The whole of them can not possibly be arranged in a single class; for they have not one thing in common. The class of Euphrenics, and the class of Narcotics would still be necessary for the two groups of articles that I have just specified, just as necessary as they are under the arrangement I adopt.

If a given article is capable of producing a suspension of the functions of the hemispheres of the cerebrum, it is evidence that it is either a Narcotic or a Euphrenic. For determining which

of these it may be, we must ascertain the character of the suspension, and the previous operations. But I doubt not that there are many decided Narcotics, and a greater number still of decided Euphrenics, that in their crude state, are not sufficiently active to produce either the coma of the Narcotics, or the Anæsthesia of the Euphrenics, in any quantity, in which they can be conveniently taken, at least without concentration. It is my present belief that a greater or less number of articles are now reckoned as Narcotics, because they have been observed to be capable of producing a suspension of the functions of the hemispheres of the cerebrum (of what character has not been inquired after) while in reality they are entirely destitute of all Narcotic power, and are in fact simple and pure Euphrenics. On what ground, for example, has Protoxyd of Etherogen or Common Æther ever been reckoned a Narcotic, except its capability of producing Anæsthesia, which has been mistaken for the coma of a Narcotic? I never could make it produce either the Antirritant, Anodyne, or Soporific grade of a Narcotic operation, nor one single symptom of Ultimate-Narcosis, unless its Anæsthesia is reckoned as such; and this I consider as materially different from the coma of a Narcotic. I shall hereafter mention other articles that are universally misreferred to the Narcotics on account of their Anæsthetic operation, which I believe to be simple and pure Euphrenics, and destitute of all the additional powers, which Protoxyd of Etherogen or common Æther possesses.

The tranquilizing power of the Euphrenics is truly remarkable, so much so, that it is often mistaken for one of the primary, proximate or medicinal grades of the operation of an active Narcotic. The obviating of languor and lassitude, and the production of a calm, placid and pleasant sensation, has indeed a nearer resemblance to the Antirritant grade of a Narcotic operation, than any other stages of the effects of the two classes. Still the first two grades of a Euphrenic operation are much more prominent and agreeable, than the Antirritant grade of a Narcotic operation. But if the articles are pushed further, the Euphrenic produces preternatural wakefulness, while the Narcotic produces Anodyne and Soporific effects. The early, primary, proximate or medicinal grades of the operation of these two classes are never the less easily distinguishable.

It will doubtless be said however, that some articles, by peculiar management, may be made to produce both sets of these effects. This is unquestionably true, since there are some articles, which possess both of these powers, which are both Narcotic and Euphrenic. Euphrenic and Narcotic powers are frequently conjoined in the same article. In such cases, the medicinal grades of the operation of both classes, will be obvious under appropriate management in appropriate circumstances for the production of each. How many articles does the group Euphrenica-Narcotica properly and truly comprise, omitting all the equivocal uncertain and doubtful ones? The number is not great; but in its proper place, I shall endeavor to specify all, of which I have definite and precise knowledge. A few examples in this immediate connexion will be all that is at present necessary. *Papaver somniferum* is a fair example of an article which possesses both Euphrenic and Narcotic powers; and several other powers even in addition to these. *Vinum Vitis Viniferæ* is an unequivocal Euphrenic. It is Narcotic also, and possesses several other powers besides. Alcohol is most decidedly Euphrenic, and has a number of other powers in addition. Perhaps the kernel of the fruit of *Myristica aromatica*, and the essential aid of *Tanacetum vulgare* are both Narcotic and Euphrenic; but I do not speak confidently of this, never having investigated these articles to my own satisfaction. *Nicotiana Tabacum* undoubtedly possesses both Euphrenic and Narcotic powers, as well as several others in addition. Undoubtedly then, there are articles which possess both Narcotic and Euphrenic powers in conjunction. But this need occasion no difficulty in the discrimination of the two classes, since there are so many Narcotics intirely destitute of any Euphrenic power, and so many Euphrenics intirely destitute of any Narcotic power. There are numerous articles producing distinctly every grade of operation that enters into the definition of a Narcotic, without producing the least trace, that I could ever detect, of any grade of a Euphrenic operation. On the other hand there is a considerable number of Euphrenics, and some of them among the most active, as Protoxyd of Nitrogen for example, which, so far as I have been able to discover, never produce the least trace of any grade of a Narcotic operation. Indeed there are many pure Narcotics, and many pure Euphrenics.

I believe that these two classes may be easily and readily distinguished not only by their primary, proximate or medicinal grades of operation, but also with equal facility by their ultimate grades. Euphrenics may be easily distinguished from Narcotics by the fact that there are no direct Antirritant, Anodyne and Soporific stage of their operation; but, in their stead, the obviation of languor and lassitude when it exists; the production of a peculiar preternatural and rather agreeable and not exhausting wakefulness; and the production of a greater or less degree of positive exhilaration. The first four grades of a Euphrenic operation, are certainly very widely different from all the medicinal grades of a Narcotic operation.

All known true and proper Narcotics, except Cyanogen perhaps and its compounds, are of vegetable organic origin; and no true and pure Narcotic is ever a direct exhausting agent after the manner of the Antiphlogistics; unless the *Ætheres* constitute an exception, which I do not think is the fact, since I am persuaded that the state of insensibility to pain, which they produce is the *Anæsthesia* of a Euphrenic, and by no means the coma of a Narcotic.

Beyond all doubt, as I think, *Papaver* possesses both Euphrenic and Narcotic powers in contradistinction from each other; and the Narcotic power greatly predominates over the Euphrenic power. Under various circumstances, this agent may without difficulty be so managed as to produce distinctly only the first four grades of a Euphrenic operation, without any appreciable amount of Narcotic operation; and in various other circumstances, it may without difficulty be managed so as to produce distinctly the Antirritant, Anodyne and Soporific grades of a Narcotic operation, without any appreciable amount of a Euphrenic operation. Sometimes we obtain the specified grades both of a Euphrenic operation and a Narcotic operation in conjunction. I never saw any grade of a Euphrenic operation beyond that of exhilaration produced by *Papaver*. When it is pushed beyond the production of exhilaration, its Narcotic power is brought into such active operation, as to transcend and supersede any further Euphrenic effects. No mere Euphrenic ever produces effects at all like the Ultimate-Narcosis of *Papaver*. It is my opinion that the active Narcotics and the active Euphrenics may always be

distinguished by the difference in the character of the suspension of the functions of the hemispheres of the cerebrum which they respectively produce.

It is assuredly a great mistake to suppose that all suspensions of the functions of the hemispheres of the cerebrum are pathologically the same. I have long been in the habit of considering that five at least may be easily and readily discriminated by the laws of their access, progress and termination, viz. that of Catalepsia, that of Hysteria, that of Lethargus, what is commonly called Coma, and that of Paralysis known by the name of Apoplexia. Perhaps the insensibility produced by syncope is specifically different from any of the preceding, as I am very strongly inclined to believe that it is. Perhaps there is another still, viz. a true Stupor of the hemispheres of the cerebrum, such as is, in all probability producible by the pure and intense Erethistics, at least by some groups of them.

All the Narcotics whose operation I have had opportunity to witness, if sufficiently active, and if pushed to a sufficient extent, appear to me to produce unequivocal, true and pure coma; while the Anæsthesia of the Euphrenics that I have just mentioned, and indeed of all others, with which I am acquainted, seems to me to be a state or condition very materially and essentially different in quality, and regulated by different laws, not only as respects phenomena for the time being, but as respects access, duration and disappearance. I could never discover any appreciable difference in the coma produced by the different Narcotics, where Ultimate-Narcosis had proceeded to the extent of the production of perfect Coma—except perhaps in the suspension of the functions of the hemispheres of the cerebrum, which is produced by *Atropa lethalis*, and the several medicinal species of *Datura*. The Coma, so called, of Narcotics, in all cases that I have had opportunity to witness, has always been true and proper coma, in no way distinguishable from the Coma of disease; though possibly a few unequivocal Narcotics do not produce Coma but a different specific suspension of the functions of the hemispheres of the cerebrum. I make this last remark however, by way of salvo, in reference to two or three articles which are pertinaciously claimed as Narcotics, but which I have long been satisfied are mere and pure Euphrenics. The principal ground on which they are al-

leged to be Narcotics, is what is supposed to be a considerable degree of Soporific power. But I never witnessed any such effect from them. Only those who are liable to fall asleep whenever they are quiet, ever sleep after taking these articles, one of which is *Cannabis Indica*. The Coma of a true and pure Narcotic may be produced in any degree, without being preceded by a single symptom of true Euphrasy.

In all cases in which Narcotic and Euphrenic powers are conjoined in one article, I believe that the Coma of the Narcotic always precedes, transcends and supersedes the Anæsthesia of the Euphrenic. As respects the time of its supervention, I believe that the coma of the Narcotic always occurs before the Anæsthesia of the Euphrenic can possibly be expected, at least from an agent taken into the stomach; and by its intensity and duration, I believe that it always transcends and supersedes it. It appears to me to be vain to think of perceiving any trace of Anæsthesia, at least from any article that is more active as a Narcotic, than as a Euphrenic.

According to my observations and my best judgment the quality of the Anæsthetic grade of the operation of Protoxyd of Nitrogen, of Protoxyd of Etherogen, of Tritochlorid of Formicigen, etc. is materially and essentially different from any grade of the operation of any Non-Euphrenic Narcotic. Though (as I have already inculcated) I am satisfied that the Narcotics and the Euphrenics may be readily and perfectly distinguished, and that without hazard of error, by the first three grades of the operation of the former, and the first four grades of the operation of the latter; yet the coma of the former, and the Anæsthesia of the latter, if any way carefully observed, are no less diagnostic of the two classes. As appears to me, the Anæsthetic grade of a Euphrenic operation differs as widely from Ultimate-Narcosis and even from the Coma of a Narcotic, as the anterior grades of these two powers.

But what is the true nature and character of the insensibility produced by the Euphrenics? My attention has been more or less turned to this subject ever since the period of my professional pupillage, which terminated in 1810. It is certainly not Apoplexia, nor is it Coma, nor Lethargus, nor Syncope, if this is a distinct specific sort of insensibility, nor Stupor, if such a condition

of the hemispheres of the cerebrum ever happens. But two other sorts of suspension of the functions of the hemispheres of the cerebrum remain. It appeared to me long ago, that the state of insensibility, which not infrequently occurs as a part of Hysterie Fits, and likewise in Ecstasis (if there is such a disease distinct from Hysteria, which I doubt) is identical with the Anæsthesia of a Euphrenic or with nearly all the Euphrenics with whose Anæsthesia I am acquainted.

There is one Euphrenic, the state of insensibility from which, is considered as unequivocal and distinct Catalepsy, viz. Cannabis Indica. As the suspension of the functions of the hemispheres of the cerebrum which is produced by nearly all the Euphrenics now known, seems to be identical with that occurring in Hysteria, but in a single instance is identical with that occurring in Catalepsia, it is quite possible that Euphrenics may yet be discovered, whose stage of insensibility may be identical with each of the pathological suspensions of the functions of the hemispheres of the cerebrum. We should then have some Euphrenics whose stage of insensibility would be true Coma; but this would not convert such Euphrenics into Narcotics, any more than the whole operation of Cannabis Indica is converted into mere Catalepsy because its stage of insensibility is Catalepsy. I have no sort of reason to conclude that the Anæsthesia of any individual Euphrenic, if carefully examined, is ever a very exact counterfeit of true Coma, whether that of a Narcotic or of disease.

The Anæsthesia of a Euphrenic is never produced without being preceded by a transient degree, at least, of several stages of a Euphrenic operation. In the Anæsthesia of a Euphrenic perfect consciousness is often retained, which is never the fact, in the coma of a Narcotic, when it is perfect at least. The Anæsthesia of the different individual Euphrenics has always appeared to me to be just about as peculiar as the preceding stages of their Euphrenic operation. Perhaps the Anæsthesia of the different *Ætheres* may be more similar, or more nearly identical, than the Anæsthesia of the vegetable Euphrenics. The Anæsthesia of *Thea Sinensis* differs as much from any form of Coma, that I ever saw, as Catalepsia does; and it appears to differ somewhat from the Anæsthesia of the *Ætheres*, at least in permanence. A practitioner of medicine who can not distinguish the Coma of *Papaver* from

the Anæsthesia of Protoxyd of Etherogen, after his attention has once been called to their difference, must, as appears to me, be incapable of recognizing many of the differences positively essential to discriminating and judicious practice, in a multitude of cases, of comparatively frequent occurrence.

The late custom of making use of this peculiar state of insensibility produced by the Euphrenics of chiminal origin, for the performance of the most formidable, as well as the most trifling operations, has given it an importance which it was never before suspected of possessing. It is more than doubtful with me, whether the surgeons have yet selected the best of this class of agents for their particular purpose. It is obvious that the article used ought to have no power, whose operation and effects are contraïndicated in the subjects to be operated-upon. In this view, Tritochlorid of Formicigen or Chloroform is peculiarly objectionable, since it is one of the most active direct exhausting agents in the whole materia medica. Indeed I question whether there is another article known, which is capable of destroying life by direct and immediate exhaustion of the powers and energies of the involuntary motor nerve of chiminal action nutrition and reproduction, with so much speed and in so short a time, and this when it is pushed only to the extent necessary to produce the desired Anæsthesia. This quality ought wholly to bar its use, however eligible it might be in other respects. For convenience of administration and speed of operation as an Anesthetic, and particularly for lightness and brevity of the stage of exhilaration, in comparison with the intensity of its stages of Anæsthesia, this article is at present perhaps without a known equal.

In their customary small doses, many articles belonging to the class of Euphrenics, appear to produce little or no effect upon a person of ordinary susceptibility, and in health; but when pushed to an extent rather inconvenient from quantity, even such a subject will experience the first two grades of their operation; and much more a person affected only with a moderate disease, but one in which the susceptibility is considerably increased. There are several articles at least, and probably many more than those to which I now have especial reference, that are uniformly associated by physicians, with others that I very well know to be Euphrenics, from which I never witnessed the least operative ef-

fects for many of the earliest years of my professional life, and which I had concluded, as I supposed with the best reasons, to be absolutely inert. At last, in a subject of great natural susceptibility, after a paroxysm of *Cephalodynia nauseosa* or Sick Head-ache, of more than thirty-six hours continuance, during which absolutely no food at all had been taken, the patient at her own prescription (not mine) took one of the articles that I had concluded (as I supposed with good reason) to be completely inert, on which, to my surprise, the first two grades of a Euphrenic operation were plainly manifested. After this, I could no longer doubt that the very feeblest of the articles, that have been so long associated by physicians with unequivocal Euphrenics, may, under the most favorable circumstances, produce the effects that have been so long attributed to them by classification, even though they are perfectly inert upon those in health, and also upon those of ordinary susceptibility when affected with ordinary diseases.

All true proper and genuine Euphrenics then, produce a greater or less number of the preceding grades of effect, the weaker ones a less number, the stronger ones, a greater number, and the very strongest produce the whole of them. Different Euphrenics vary very much in the different relative degree of each of the states or stages, which they respectively produce; and many seem to be incapable of producing the fourth state or stage, at least with any material intensity, or any state or stage beyond it. However, it is not always safe to conclude that a given article will not produce either of these states or stages, when we have not happened to push such article to its greatest possible extent. From what we learn of *Thea Sinensis* from its ordinary use, we should naturally conclude it incapable of producing *Anæsthesia*; and yet, I very well know that it is capable of producing this stage of the operation of a Euphrenic, and that in a sufficiently intense and protracted form to admit of almost any surgical operation however severe. But it is necessary to take quite an inconvenient quantity of this article, in order to occasion what I describe.

I am inclined to think that there are some Euphrenics which only obviate languor and lassitude, without producing any other grade of the operation of this class of remedies. If I am not in error, can such articles be clearly shown to be Euphrenics? Are there any other medicinal agents beside Euphrenics that ever di-

rectly obviate languor and lassitude, without any further operation? I think it quite likely however, that if pushed further, or used in a state of greater susceptibility, all of these articles would produce, at least, the second grade of operation, and perhaps the third. If there are Euphrenics which only obviate languor and lassitude, there are doubtless Euphrenics that only obviate languor and lassitude and produce the peculiar calm pleasant and placid sensation. It is my belief that there are very many Euphrenics that produce only these two grades of operation. Such articles must be more easy of identification as Euphrenics than those which produce only the first grade of operation. It is quite possible however that even these, if pushed still further, or used in a state of greater susceptibility, might produce grades of effect beyond what I have named.

There are certainly numerous Euphrenics which obviate languor and lassitude, produce the peculiar calm, placid and pleasant sensation, and occasion the peculiar preternatural wakefulness, and are incapable of operating any further, as Euphrenics, unless in a greater state of susceptibility, or by being pushed to a degree inconvenient perhaps from the bulk of the article. There are very many decided Euphrenics, that obviate languor and lassitude, produce the peculiar calm placid and pleasant sensation, occasion the peculiar preternatural wakefulness, and finally cause a greater or less degree of decided exhilaration, but which are not known to be capable of producing Anæsthesia. It would however be injudicious to deny them the capability of producing this effect, till they are known to have been pushed to the greatest practicable extent, without any such operation.

The grade of preternatural wakefulness, but much more especially the beginning of the grade of exhilaration, as produced by the Euphrenics, has so much resemblance to a certain grade of the operation of the Erethistics, that some of my pupils, in the early part of their practice, have found it difficult to decide as to which of these two classes a given article should be referred. If no observations are made in regard to previous effects, and if the article is pushed no further, it may perhaps be difficult to distinguish these individual and particular grades of Euphrenic effect, and in all cases, from an individual and particular grade of Erethism, but if we take into view all the several grades or stages of each,

be sufficiently different, and can always be readily distinguished. A single one or two of the grades of a Euphrenic operation may perhaps accord sufficiently with the definition of an Erethistic, but then it will be an Erethistic of a very different quality; certainly it is not admissible to reckon the several grades of operation of a single power as different and distinct operations. The only way of deciding to which a given grade of operation may be referred about equally well either to a Euphrenic or Erethistic power, really and truly belongs, is to ascertain whether the article under investigation is capable of producing an effect of a Euphrenic operation that can not be referred to an Erethistic; or whether it is capable of producing Erethism in any part of the nervous system beside the hemispheres of the cerebrum.

Such inquiries will usually lead to a correct decision. It is unquestionably the fact that distinct Euphrenic and Erethistic powers may be conjoined in one individual agent; and it is true that a certain grade of a Euphrenic operation, as that of a Neuragic, Narcotic, and Antisbestic, a Tonic and Anæsthetic operation is an Erethism of a somewhat peculiar quality; as produced by each class of these agents. Atropa and the several species of Datura, as *Datura fastuosa*, *Datura innoxia*, *Datura Metel*, *Datura Stramonium*, *Datura Tatula*, produce an effect, which might perhaps be considered either as the third and fourth grades of a Euphrenic operation; or as a certain grade of an Erethism of the hemispheres of the cerebrum. We ever rather the latter than the former. *Conium maculatum* produces an effect, which perhaps might be considered either as the third or fourth grade of an Euphrenic operation, or as a certain grade of Erethism of the hemispheres of the cerebrum. *Scrophularia Actæoides* produces effects, which in an insulated case might perhaps be considered either as the third and fourth grades of a Euphrenic operation, or as a certain grade of Erethism, but we do not take into consideration the whole of its effects. The thing in view, there can be neither doubt nor question that it is Erethistic and not a Euphrenic.

Strychnos nuxvomica and certain species of *Strychnos*, the very same Erethistics, such as *Strychnos Nux-vomica*, *Strychnos Pruriens*, *Strychnos Potatorum*, *Strychnos Tieuté*, *Strychnos Aconitifolia*, &c. if we contemplate only a certain grade of their

rectly obviate languor and lassitude, without any further operation? I think it quite likely however, that if pushed further, or used in a state of greater susceptibility, all of these articles would produce, at least, the second grade of operation, and perhaps the third. If there are Euphrenics which only obviate languor and lassitude, there are doubtless Euphrenics that only obviate languor and lassitude and produce the peculiar calm pleasant and placid sensation. It is my belief that there are very many Euphrenics that produce only these two grades of operation. Such articles must be more easy of identification as Euphrenics than those which produce only the first grade of operation. It is quite possible however that even these, if pushed still further, or used in a state of greater susceptibility, might produce grades of effect beyond what I have named.

There are certainly numerous Euphrenics which obviate languor and lassitude, produce the peculiar calm, placid and pleasant sensation, and occasion the peculiar preternatural wakefulness, and are incapable of operating any further, as Euphrenics, unless in a greater state of susceptibility, or by being pushed to a degree inconvenient perhaps from the bulk of the article. There are very many decided Euphrenics, that obviate languor and lassitude, produce the peculiar calm placid and pleasant sensation, occasion the peculiar preternatural wakefulness, and finally cause a greater or less degree of decided exhilaration, but which are not known to be capable of producing Anæsthesia. It would however be injudicious to deny them the capability of producing this effect, till they are known to have been pushed to the greatest practicable extent, without any such operation.

The grade of preternatural wakefulness, but much more especially the beginning of the grade of exhilaration, as produced by the Euphrenics, has so much resemblance to a certain grade of the operation of the Erethistics, that some of my pupils, in the early part of their practice, have found it difficult to decide as to which of these two classes a given article should be referred. If no observations are made in regard to previous effects, and if the article is pushed no further, it may perhaps be difficult to distinguish these individual and particular grades of Euphrenic effect, and in all cases, from an individual and particular grade of Erethism, but if we take into view all the several grades or stages of each,

they will be sufficiently different, and can always be readily distinguished. A single one or two of the grades of a Euphrenic operation, may perhaps accord sufficiently with the definition of an Erethism, but then it will be an Erethistic of a very different quality; and certainly it is not admissible to reckon the several grades of the operation of a single power as different and distinct operations. The only way of deciding to which a given grade of operation that may be referred about equally well either to a Euphrenic or an Erethistic power, really and truly belongs, is to ascertain whether the article under investigation is capable of producing any grade of a Euphrenic operation that can not be referred to Erethism; or whether it is capable of producing Erethism in any other part of the nervous system beside the hemispheres of the cerebrum. Such inquiries will usually lead to a correct decision.

It is unquestionably the fact that distinct Euphrenic and Erethistic powers may be conjoined in one individual agent; and it is likewise true that a certain grade of a Euphrenic operation, as well as of a Neuragic, Narcotic, and Antisbestic, a Tonic and an Adenagic operation is an Erethism of a somewhat peculiar character, as produced by each class of these agents. *Atropa lethalis*, and the several species of *Datura*, as *Datura fastuosa*, *Datura ferox*, *Datura Metel*, *Datura Stramonium*, *Datura Tatula*, produce an effect, which might perhaps be considered either as the third and fourth grades of a Euphrenic operation; or as a certain grade of an Erethism of the hemispheres of the cerebrum. It is however rather the latter than the former. *Conium maculatum* produces an effect, which perhaps might be considered either as the third or fourth grade of an Euphrenic operation, or as a certain grade of Erethism of the hemispheres of the cerebrum. Even *Botrophis Actæoides* produces effects, which in an insulated view might perhaps be considered either as the third and fourth grade of a Euphrenic operation, or as a certain grade of Erethism, if we did not take into consideration the whole of its effects. The whole being in view, there can be neither doubt nor question that it is an Erethistic and not a Euphrenic.

Even *Ignatia amara* and certain species of *Strychnos*, the very types of the Erethistics, such as *Strychnos Nux-vomica*, *Strychnos Colubrina*, *Strychnos Potatorum*, *Strychnos Tiénté*, *Strychnos Ligustrina*, &c. if we contemplate only a certain grade of their

operation, might perhaps, be considered as Euphrenics, producing the third and fourth grades of their operation, or as Erethistics producing Erethism of the hemispheres of the cerebrum.

But when we consider the whole of their operation and effects, there ceases to be the least ground for question as to the class to which they really and truly belong. At the time when I first began to watch the whole operations and effects of the several articles that I have just mentioned, but before I was perfectly acquainted with them, I assigned them a Euphrenic power, which further knowledge showed me was really an Erethistic power. But certain grades of a Euphrenic operation in fact constitute an Erethism *sui generis*; and yet, if we take into consideration every grade of a Euphrenic operation, there can not be the least doubt that the Euphrenics constitute a class essentially distinct from the Erethistics. If Euphrænia, as produced by every individual Euphrenic were a perfectly identical condition; and in like manner Erethism as produced by every individual Erethistic were equally identical, there would be no occasion for this explanation; but when we consider that Euphrænia as produced by different articles, is as various as the articles themselves, and that the same is equally the fact with Erethism, the present explanations become important.

In ordinary practice, Euphrenics are seldom pushed to such an extent, as to produce any other grade of their operation than the obviating of languor and lassitude, or at the most, the production of a moderate degree of a calm placid and pleasant sensation; and even these effects are seldom distinctly perceived, and referred to their proper cause. When associated with other physicians, in attendance upon a case, in which Euphrenics have been prescribed, I have sometimes noticed the effects just mentioned and ascribed them to the Euphrenic employed, to the great surprise of the gentleman with whom I was associated in the treatment of the case. In fact the correctness of such an ascription has often been doubted and sometimes denied. I have often met with physicians, who had no knowledge, and apparently no suspicion, that this class of remedial agents had any regular operative effects as a class, or that the same effects were ever produced by any two of them, unless it might be by that small group the fetid inspissated saps, such as those of *Narthex Assa-foetida*, *Opop-*

panax Chironium, etc. On making inquiries after the principles on which such gentlemen were in the habit of prescribing the Euphrenics, when I have received any intelligible reply, it has been, that they gave them as *Nervines*. When I have asked what was understood by *Nervine*, whenever I have received any intelligible reply, it has been that *Nervine* is any thing that "soothes the nervous system," which was the end of the matter.

Is either the exhilaration, or the Anæsthesia of the pure simple and unmixed Euphrenics liable to be succeeded by any kind or degree of prostration? I do not think that this question can be correctly answered in one word. The Protoxyd of Nitrogen is certainly a pure, simple and unmixed Euphrenic, the head and type of the Euphrenics of inorganic chymical origin. I have very often witnessed an exhilaration, in which the actions of the subject were intirely beyond the control of the will, produced by the Protoxyd of Nitrogen, and never in a single instance did I ever know it to be succeeded by any kind or degree of prostration; but when the effect passed-off, the subject was exactly as before this agent was taken. When however the patient took violent exercise, or made powerful exertion while under its influence, the respiration and the circulation of the blood were always affected, just as they would have been, had the same violent exercise been taken, and the same powerful exertion been made without the use of the Protoxyd of Nitrogen. I have known this fatigue however mistaken for prostration, and supposed to be the direct effect of the cessation of the operation of the Euphrenic. I never witnessed the Anæsthesia of the Protoxyd of Nitrogen very many times, but when I have seen it, it always passed-off perfectly, leaving the subject as before this agent was taken, and without any trace of prostration of any kind or degree.

Protoxyd of Etherogen i. e. Common Æther, possesses a Euphrenic power almost identical in kind and degree with the Euphrenic power of Protoxyd of Nitrogen; but in addition to this, it possesses two or three intirely different and distinct powers, viz. what I call an Oresthetic power, and a direct exhausting power, beside a greater or less degree of Diuretic power. I can make the same statements exactly in regard to Protoxyd of Etherogen i. e. Common Æther as with regard to Protoxyd of Nitrogen. I have very often seen it pushed to the production of exhilaration in

which the actions of the subject were beyond the control of his will; and I have also, in many instances, seen it pushed to the production of its Anæsthesia; and in both sets of cases, the effects passed-off clear, leaving no prostration or any thing unnatural behind. When Protoxyd of Etherogen is employed to produce Anæsthesia for the performance of a surgical operation, I have known in a few instances, great injury done, in particular subjects, by its direct exhausting power; but the manifestations of this were always in the cardiac and arterial system, and other parts dependent upon the nerve of chymical action, nutrition and reproduction; and the injury consisted in exhaustion, and not prostration. The morbid effects of an Oresthetic power are never prostration, but instead, are inordinate susceptibility, Phlogosis of the erythematic sort, and exhaustion.

The Tritochlorid of Formicigen commonly but incorrectly called Chloroform; like the Protoxyd of Etherogen, i. e. Common Æther, in addition to its Euphrenic power possesses also an Oresthetic power and a direct exhausting power. All its powers however are in different proportions from the powers of Protoxyd of Etherogen. 1. The exhilarant grade of its Euphrenic operation, is less in proportion to the Anæsthetic grade, than the Protoxyd of Etherogen. 2. The Oresthetic power is considerably less, in proportion to its other powers than in Protoxyd of Etherogen; 3. Its direct exhausting power is considerably greater in proportion to its other powers than in the Protoxyd of Etherogen. 4. It is likewise Diuretic, but exactly to what extent I have not investigated. I have often seen Tritochlorid of Formicigen pushed to the production of its Anæsthesia and always with the production also of more or less true and proper exhaustion, and some times with a very undesirable degree of it. It is well known some times to have destroyed life. The last effect is never the result of its Euphrenic power but always of its exhausting power.

On the passing-off of the Anæsthesia of Tritochlorid of Formicigen, or Chloroform, there is usually, but not always, more or less prostration in addition to the exhaustion. This prostration is usually indicated by greater or less languor and lassitude; greater or less vertigo on motion or exertion; greater or less nausea, and some times even vomiting whenever the subject changes from a horizontal position, etc. The fact that these effects disappear

after a night's rest, sufficiently evinces that they are mainly prostration and not exhaustion. Thus, it appears that a Euphrenic of inorganic or chiminal origin at least, occasionally produces more or less prostration, immediately after its direct effects have passed-off; and I dare say there are more, that will do this; though I suspect they will all be found among those which possess a direct exhausting power, in addition to their Euphrenic power.

As respects *Amanita Muscaria*, which I consider as standing at the very head and front, and as being typical of the pure simple and unixed Euphrenics of vegetable-organic origin, Baron Murray says, after describing the most intense grade of exhilaration, and the suspension of the functions of the hemispheres of the cerebrum "ex quo dum expergiscuntur sensim absque alia mala sequela ad pristinam animi serenitatem redeunt." It is true that it is stated in the *Pharmacopœia Batava* (Lipsiæ 1824) that these operative effects pass-off "cum insequenti virium prostratione;" but this is in contradiction to all other good authority, and is doubtless incorrect. A vast amount of the contents of our books on the materia medica was first stated as presumptive, and from this adopted by others as matters of fact. Some of the early writers on *Lobelia inflata*, *Sanguinaria vernalis* and *Veratrum viride* presumed that these articles are Cathartic because they are Emetic, and subsequent writers set them down as positively Cathartic. Such an assertion once made can never be got rid of. The writer who first made the assertion will be quoted as an authority till dooms-day. No correction of such an error can ever rid the profession of it. I am satisfied that this is the true history of the origin of all the assertions that *Amanita Muscaria* is prostrating, for I have investigated the subject. Never the less, if a subject makes violent exertion, during the exhilarating operation of this article, it will produce fatigue, which, under such circumstances is invariably reckoned as prostration produced by it.

Cannabis Indica, even where it has suspended the functions of the hemispheres of the cerebrum, is said to occasion no prostration, when its effects first pass off. *Thea Sinensis*, an active, though not absolutely a pure, simple and unixed Euphrenic, since it is Styptic in addition to its Euphrenic power, is not followed by any prostration when its most powerful effects have been produced, even a suspension of the functions of the hemispheres

of the cerebrum. I have never heard of any prostration, as a sequel to the fullest operation of any of the Euphrenics of animal organic origin. From the preceding facts, I think that the inference is fair that as a general rule, prostration does not occur as a sequel of the passing-off, even of the most intense operation of the pure, simple and unmixed Euphrenics; though there are some exceptions to the rule, especially among those articles that have other powers in addition. But this topic will be best treated in connexion with individual Euphrenics.

By virtue of all the operations mentioned in my definition, the Euphrenics appear to allay indirectly, and to a moderate extent only, morbid irritability and irritation and irritative actions generally; morbid sensibility and sensation and soreness generally; morbid mobility, restlessness and jactitation; and also preternatural wakefulness; when connected with a non-phlogistic, or a positively atonic diathesis.

Are the Euphrenics really and truly Aphrodisiacs; or do they merely render a person unable to control or prevent the display of a previously existing passion? With the exception of one case, all the instances within my knowledge, that would at all favor an affirmative answer to either question, have been of just such a grade, as to lead to the opinion that the Euphrenic only deprived the subject of the power of decorous restraint, without exalting the natural Venereal appetite. The single case excepted was that of a man thrown into a temporary and transient but exquisite *Lagnesis Furor*, by the respiration of Protoxyd of Nitrogen to the production of powerful exhilaration, which required several men to restrain him from violence to a lady present whom he was about to marry. But I know some thing more in relation to the operation of Protoxyd of Nitrogen in this respect; still I do not know enough, even of that article, to say positively which of the two effects implied by the question with which I began my remarks upon this subject, it really produces. From numerous observations upon young men under the full influence of Protoxyd of Nitrogen, I ascertained long ago, that the presence of ladies was inexpedient, when it was about to be taken by such subjects. Since my attention was first drawn to this subject, I have rarely seen it used freely without a manifestation of greater or less lasciviousness, often too slight to attract the attention of an uncon-

scious observer, but still obvious enough to a physician aware of this property of the Euphrenics.

Much has been said of the Aphrodisiac powers of *Thea Sinensis*, and of the Antaphrodisiac powers of *Coffea Arabica*; and many tales have been related to me by physicians, which were supposed to be favorable to one side or the other of the question of the Aphrodisiac powers of both these articles. Every man of extensive reading in the *materia medica* is well acquainted with the oriental tale related by Engelbert Kæmpfer of the restoration of a spado to virility by *Thea Sinensis*; and also with the Turkish tale related by Baron John Andrew Murray, of the reduction of Horses to the condition of spadones, by feeding them upon *Coffea Arabica*; the one tale I venture to say, full as true as the other. The truth appears to me to be that neither Tea nor Coffee, as ordinarily employed, is Aphrodisiac; and this is the most that I can say upon this subject, from any observations that I have ever had opportunity to make.

I have long been satisfied that both Wine and Alcohol are Aphrodisiac. I affirm this of both these articles, because I do not believe that Alcohol is the active principle of pure natural Wine. I have however, been in the habit of attributing the effects under consideration to the Antisbestic rather than to the Euphrenic power of these articles. So decided is this operation both of Wine and Alcohol that I never had opportunity to investigate facts in regard to any tippler, whom I did not find to be affected with a greater or less degree of Lagnesis, even after his powers were exhausted. Since my attention was first called to the subject, I have never witnessed a case of the disease so absurdly called *Delirium tremens*, in which there were not indications of a certain amount of Lagnesis, slight in some cases, and more considerable in others. It is now a considerable time since I have believed that all cases of Rape are committed, either by tipplers, or by persons under the strong influence of Alcohol for the time being. In a broken-down tippler, the appetite is always increased, even after the power of gratifying it is lost. I do not know that any body understood this subject, as connected with Wine and Alcohol better than Shakespeare. "Lechery sir, it provokes and unprovokes; it provokes the desire, but it takes away the performance; therefore, much drink may be said to be an equivoca-

tor with lechery; it makes him and it mars him; it sets him on, and takes him off; it persuades him, and disheartens him; makes him stand-to, and not stand-to; in conclusion, equivocates him in a sleep, and, giving him the lie, leaves him." (*Macbeth, Act II, Scene III.*)

A strong argument in favor of the opinion that the Aphrodisiac power of Wine and Alcohol is due to their Antisbestic, rather than to their Euphrenic power, is derived from the reputation of being decidedly Aphrodisiac, which has so long belonged to *Rhus venenata*, *Rhus Vernicifera*, *Rhus perniciosa*, and various other nearly allied articles, and also to *Cantharis vesicatoria*, and various other nearly allied Insects; and finally to *Phosphorum elementarium*; the whole of which are Antisbestic and Oresthetic in an intense degree but are not at all Euphrenic. Upon the whole, the evidence of the supposed Aphrodisiac powers of the Euphrenics appears to me to be unsatisfactory.

The Euphrenics enable persons to dispense with sleep, for a surprisingly long time, and apparently with perfect impunity. This will perhaps be more intelligible if stated in a somewhat different manner. If a person is kept under just that amount of the influence of a Euphrenic, which produces the peculiar preternatural but rather agreeable wakefulness, mentioned in my definition of Euphrenics, the subject does not, for a very considerable time, experience any inconvenience from the want of sleep. How long sleep may be actually dispensed with in this way, without injury or inconvenience, I know not. I have known it done for several days. Those who use *Erythroxylon Coca* dispense with sleep, as well as with food, for unusual and great lengths of time, under labor, hardship and fatigue, and this apparently with perfect impunity. It is said that under the influence of *Paullinia sorbilis*, sleep may be dispensed with for a considerable period of time, and under the labor and fatigue of exploring an unsettled country, and with apparent impunity.

The same is said of *Catha edulis*, a shrub of Caffa or Caffé, the native country of Coffee. For this power, it has been introduced into Arabia, along with the Coffee, where it is cultivated, though to what extent I know not. It is used in its native country for its effects as a Euphrenic, notwithstanding the abundance of Coffee in the same region. The operation of *Coffea Arabica* is precisely

similar in reference to sleep, to the articles previously mentioned. I have often known persons use *Thea Sinensis* with great freedom for the purpose of enabling them to dispense with sleep for extraordinarily long periods of time and apparently with both success and impunity. It is my present belief that *Cannabis Indica* has the same operation as respects sleep. At all events, from a single large dose, I was once unable to sleep at all, for more than thirty-six hours, but without feeling the least want of sleep, or inconvenience of any sort. These are all pure Euphrenics, without any other power in addition.

The same statements have been made, and I doubt not with perfect truth, of many Euphrenics that possess several other powers in addition. I have investigated the cases of a number of habitual users of *Papaver*, and all of them seemed to require less sleep than others, and actually had less. In cases of disease which require large amounts of *Papaver*, within short periods of time, a patient will go a long time without sleep, and apparently without the least inconvenience. This is undoubtedly due to its Euphrenic power. But *Papaver* possesses several other powers, and among the rest, that of a Narcotic. Given to a certain amount, its Narcotic power would doubtless transcend its Euphrenic power, and then the subject might sleep much more than ordinarily.

I believe that those who use Wine habitually, require less sleep and actually take less than those who do not. But Wine like *Papaver* possesses other powers in addition, and one of these also is a Narcotic power. Every body knows that Wine taken in sufficient quantity at once, produces sleep, and that enough may be taken to produce Coma. Now the preternatural wakefulness, which it occasions, is due to the Euphrenic power, while the sleep, and even Coma, which it produces, is due to its Narcotic power, transcending its Euphrenic power. I never happened to know a tippler upon Wine; but I venture to say that he would sleep less than others. A drunkard upon it would probably sleep more; but I never knew a drunkard upon Wine, any more than a tippler. I believe that the same remarks may be made with regard to the operation of Alcohol, that have just been made with regard to Wine. I believe that tipplers upon Alcohol always sleep less than others. Most of those, whom I have known, have been very early risers I suppose on this very account.

A comparatively free use of Euphrenics will enable a person to go without food with impunity, for a considerable and indeed surprising length of time. It is said that by taking a sufficient amount of Erythroxyton Coca, a man is capable of dispensing with food for five days, without any material inconvenience, even though he is engaged in rapid traveling on foot the whole time. Dr. J. J. Von Tschudi says "A Cholo of Huari, named Hatum Huamang, was employed by me in very laborious digging." "During the whole time he was in my service, viz. five days and nights, he never tasted any food, and took only two hours' sleep nightly." "But at intervals of two and a half, or three hours, he regularly masticated about half an ounce of Coca leaves, and he kept an Acullico continually in his mouth." "I was constantly beside him, and therefore I had the opportunity of observing him closely." "The work for which I engaged him, being finished, he accompanied me on a two days' journey of twenty-three leagues across the level heights." "Though on foot, he kept-up with the pace of my Mule, and halted only for the Chacchar." "On leaving me, he declared that he would willingly engage himself again, for the same amount of work, and that he would go through it without food, if I would but allow him a sufficient amount of Coca." "The village priest assured me that this man was sixty-two years of age, and that he had never known him to be ill in his life." (*Pg. 316, 317, Ch. XV. Part II. Travels in Peru by Dr. J. J. Von Tschudi, N. Y. 1847. Translated by Thomasina Ross.*)

I have no definite information whether the use of Catha edulis, Paullinia sorbilis, etc. will enable a person to go without food as long and as well as Erythroxyton Coca; but I am inclined to think that they will, at least in proportion to the degree of Euphrenic power which they actually possess, though what this comparative degree is, I do not know. It is well known that a sufficient amount of well prepared Coffea Arabica of sufficient strength, will prevent inconvenience from want of food, for a considerable time; but how long I know not. This is commonly attributed to its supposed nutritious properties; but this, I doubt not, is an error. I do not think Coffee, as commonly prepared, even in its strongest form, furnishes any material amount of nutriment, and certainly far too little to account for the effect under consideration.

Within a few years past, the News-papers have contained a statement to the following general effect, viz. that in a certain manufacturing establishment (I believe in some part of France) it was reported that the workmen consumed only a 'surprisingly small quantity of food. From this report, suspicions were entertained in the neighborhood, that the laborers could not possibly be free to leave the establishment at their pleasure, and that they must be compelled to endure great suffering from privation of food. Soon public clamor rose to such a height, that the civil authorities or national government, appointed a commission to investigate the supposed abuses. On thorough inquiry, it was found that the workmen in this establishment did actually consume only a surprisingly small quantity of food; but still that they were in perfect bodily vigor and health, in fact that they had a greater amount of both, than laborers in manufactories generally; and beyond this, that they were perfectly satisfied with their mode of living, their work, and their employers. The small amount of food needed, could be accounted for only by the fact that the very best Coffee was kept constantly prepared and hot, as the common and exclusive beverage of the workmen, of which they gladly availed themselves at all times during the day, greatly preferring it to every thing else. When this use of Coffee was first introduced into the establishment, neither proprietors nor workmen had any knowledge of the effect that it would have in reference to the amount of food that would be required; but as all retained flesh, vigor and general health unimpaired, all were perfectly satisfied; and the civil authorities could find no pretense for interference, and no grounds for any action at all. In this they seem not to have exercised as much ingenuity as some others might have done, since a gentleman to whom I related the statement expressed a very positive opinion that this use of Coffee was full as injurious as a similar use of Alcohol would have been; and that the public authorities failed in the performance of their duty, because they did not interdict the use of it. The preceding statement (I believe) is correct so far as relates to all the essentials of the report; though quite possibly it may deviate from it, in some non-essential matters. I preserved the News-paper which contained it; but at the present time it is mislaid, so that I can not now make reference to it.

The Galla, who go to war, with no other provisions but moderately parched Coffee pulverised and made into balls or cakes with Butter, endure with impunity, great privation of sleep as well as food. It is supposed by some that a free use of Tea makes a greater quantity of food necessary. I do not think that this is true. If an unusual quantity of Tea is taken, and that continuously, I believe that the person who takes it will endure unusually protracted abstinence far better than if the Tea were not taken. But, whatever may be the fact in regard to Tea, it must be remembered that this agent is almost universally believed to be Narcotic as well as Euphrenic, which if it is the fact, might be a sufficient reason for a variation in the operation from the mere and pure Euphrenics. But, though I once believed that Tea possessed a Narcotic power as well as a Euphrenic one, a much more extensive knowledge of every grade of the operation of the Euphrenics has convinced me that what I formerly considered the Narcotic operation of Tea is only the Anesthetic grade of the operation of a Euphrenic. In a few instances, I have had opportunity to make observations upon uncommonly free drinkers of Tea, and they certainly consumed less than the average amount of food; but whether this was due to the Tea, or was their natural habit, perhaps I am not warranted in deciding; and yet I can not help ascribing it to the Tea.

Since the preceding paragraph was written my observations have been multiplied in reference to Tea, and I am well satisfied that it is no exception to the general law of the operation of the Euphrenics in enabling persons to dispense with food for a remarkable length of time, or to get along with a remarkably small quantity, and with perfect impunity. I once had knowledge of some experiments (not sufficiently followed-out, as must be admitted) in the course of which, the subject under a free use of a very strong infusion of the best Imperial (commonly so called) took only about one-fourth of his customary quantity of food for about a fortnight. This seemed to be all that was required by the system—all for which there was appetite. This was taken only night and morning. During the whole time of this experiment, and for the week immediately succeeding, the subject insisted that he felt no want of food, and was perfectly well, and that he never felt better in his life; and also that he was never capable of greater

bodily or mental exertion. The quantity of food that this subject took habitually was moderate, though not by any means positively sparing. The subject himself believed that he could have continued the same course indefinitely; though this was by no means proved by the experiment.

Those habitually addicted to the use of *Cannabis Indica* (as is well known) can go without food for a very unusual length of time, without any natural inconvenience; so that this article is no exception to the rule that I am considering. I have no knowledge that a mere Narcotic power ever enables any one to dispense with food. If food is diminished under the influence of a Narcotic, the subject suffers all the ordinary ill effects of privation of food. Perhaps Papaver may be cited in opposition to this. But Papaver, it must be remembered, is Euphrenic. Papaver, if taken freely and continuously, will certainly enable a person to tolerate protracted abstinence with less inconvenience than could otherwise be borne. I have heard this ascribed to the Stimulant, meaning the Antisbestic power of this agent; but I am sure that this is an error,—I am sure that it is due to its Euphrenic power. An Antisbestic power, unaccompanied with a Euphrenic power, increases, rather than diminishes the necessity of food. In Papaver the Euphrenic power very greatly predominates over the Antisbestic power, so that, in relation to food, it often operates as a Euphrenic, rather than as an Antisbestic. I am perfectly aware that the Euphrenic operation of Papaver is always called Stimulant, and always confounded with that power which I denominate Antisbestic. But still in the explanation just cited, there was sufficient specification to prevent misunderstanding. But the operation of Papaver in relation to the appetite, hunger, digestive power and nutrition, may perhaps be considered as peculiar by some, and therefore it may need some explanation in this place.

It seems to have become a perfect axiom with United States physicians that Papaver destroys appetite, and yet as a general position, this is very far from being true. If in relation to the susceptibility of the patient and the intensity of the disease, Papaver is taken in small and uniform doses, at regular and short intervals, and continued for some time, it very generally increases appetite and digestive power; and if food is duly supplied, it also increases nutrition. I do not think that there is any reasona-

ble ground for doubt that all this is accomplished by its Antisbestic power. In certain subjects and in certain families, who probably have some peculiarities of temperament, I have found Papaver thus managed, altogether the best article within my knowledge for the restoration of appetite and digestive power, impaired by any severe disease, whether acute or chronic. I have in fact seen many cases, in which I have been utterly unable to restore appetite and digestive power without it. I now very well recollect a lady of very slender constitution who had repeatedly been reduced to a state of extreme exhaustion, by various acute diseases, to whom under these circumstances nothing would give appetite, nothing would restore digestive power except Papaver; though her case exhibited some of the ordinary indications for this article. The first time she was restored in this way, she came accidentally under my charge, after her family physician had ceased to give any medicine, because every thing which he had thought proper to employ had been ineffectual. My first medicine was the Alkaloid Morphia, disguised by solution in the officinal Tincture of Gentian; which preparation the patient had previously taken freely and perseveringly without any apparent or appreciable benefit. Disguise as respects the Papaver was necessary on account of strong prejudices, and therefore I always furnished the medicine myself. Convalescence was speedy under this simple course. First a good appetite soon existed; second greatly improved digestive power took place; and last voluntary muscular strength gradually increased. This patient was exceedingly liable to be attacked with every Epidemic that prevailed. At last it got to be a matter of course that after the crisis of every acute disease with which she happened to be attacked, her family physician was dismissed, or left the patient of his own choice, and I was soon employed. I always succeeded well, by this simple method. Even her family physician had his prejudices against Papaver; but he never interfered with my use of it, in this subject, though he would not employ it himself in this manner. In a regular consultation, he always objected to this use of it, in such a case.

But Papaver managed in quite a different manner, operates in quite a different way. When taken in single full doses, and much more in large doses, the Euphrenic operation transcends the Antisbestic operation, and the effects are like those of the pure Eu-

phrenics as respects food. Also when given in very large quantities, in the course of the twenty-four hours, even though in uniform doses, at regular intervals, the Euphrenic operation transcends the Antisbestic operation, and a comparatively small quantity of food is customarily taken, after the law of the operation of the pure Euphrenics. As I have already said, I have formerly taken pains to investigate the conditions of a considerable number of habitual users of Papaver; and in relation to food, I found that those who took the largest quantities, as from fifty to a hundred grains a day, took but a moderate quantity of food; while those who took only ten or a dozen grains or less, had strong appetites, and eat heartily. But even those who took the largest amount or the most moderate quantity of food, did not appear to be at all deficient, as respects any desirable amount of flesh, as respects voluntary muscular strength, or in short, as respects nutriment. I could never detect that the Narcotic power of Papaver, when not given in hazardous or absolutely poisonous doses and quantities, influenced the appetite, digestive power or nutrition in any way. These, I believe, are the laws of the operation of Papaver upon the appetite, upon the digestive power and upon nutrition generally.

This amount of Papaver, it is believed, will afford an analogy by which we may judge of the operation of the rest of the Euphrenics, that possess other powers in addition. As far as my knowledge extends, I believe, that the operation of Wine, in relation to food, is analogous to Papaver on the one hand, and to Alcohol on the other. These three articles possess the same powers by name, though differing more or less in quality, with the exception that Alcohol possesses one or more powers than the other two. Pure natural Wine exclusively from the grape, has hitherto been so scarce and so expensive with us, that physicians have seldom had opportunity to learn its operation and effects by observation. It is to be hoped however, that the time is not far distant, when our country will become a Wine producing one. This would be a highly auspicious event for the cause of temperance, to say nothing of its utility to medicine.

Alcohol like Papaver when taken in comparatively small doses, at regular and short intervals, the whole quantity employed in the twenty-four hours being small, or at least quite moderate, very

prominently increases appetite and digestive power—no article within my knowledge will do it more speedily or more decidedly—and this by virtue doubtless of its Antisbestic power; but when a considerably large quantity is taken in the twenty-four hours, even though in repeated doses, its Euphrenic operation transcends its Antisbestic operation, and the subject takes less food than he would require if he used no Alcohol. Inveterate tipplers upon Alcohol certainly use less food, than the temperate. An old tippler, in his last stages, scarcely uses any food. In this extremity, the subject certainly emaciates; but under the quantity of food that a moderate tippler would take, he certainly retains his flesh surprisingly.

Within a short time, a brief paragraph has been going the rounds of the News-papers, to the effect that some French medical gentlemen have long been engaged in a course of dietetic experiments, which have led to the result that when Water is the exclusive beverage, considerably more food is necessary, and it is required to be taken oftener, for the preservation of flesh and strength or vigor generally, than when (as I understand the statement) fermented and Vinous or Alcoholic liquors are used as beverages. It is added that these beverages also “prevent the wear and tear of the system, counteract depressing influences and contribute to the preservation of health and the promotion of longevity.” This seems to be noticed in our public prints only to be sneered at. Now I have long known that all this is literally and strictly true; and people may sneer at it till dooms-day without disproving it. I can not doubt that it is strictly and literally true even of Alcohol, as well as of all other Euphrenics. The difficulty about the common use of this article, is the danger of its producing intemperance. But from the common use of Wine, there is very little danger of intemperance, in fact scarcely any; and the same is true of various other fermented liquors; and there are numerous other articles, to which this objection is in no degree applicable; since intemperance in their use (so far as my present knowledge extends) would seem to be an impossibility.

Some of these latter articles are good Coffee well prepared and suitably strong (not such trashy and execrable stuff as is but too often drank among us); good Green Tea of sufficient strength to produce some effects; doubtless also Erythroxyton Coca, Paullinia

sorbilis, Catha edulis, and various other articles. I doubt not that Cannabis Indica and Amanita Muscaria might easily be so prepared as to answer equally well, though perhaps they might not be as pleasant or agreeable. Long ago I came to the conclusion that if good hot Coffee were constantly kept for a common beverage for those engaged in steady labor, it would be a matter of economy to their employers. They would obtain more labor, with a considerably less expenditure for food, and both of these to an extent which would more than pay for the Coffee drank. It may perhaps be imagined by some, that all laborers might not like this method. Doubtless some not previously accustomed to the use of this article might not at first like it exactly; but I would undertake to warrant that upon fair trial, and a reasonable time allowed for becoming accustomed to it, it would suit every one better than any other beverage ever used among us. Some little time might be necessary for a fair trial of such an experiment. Such a plan, in my opinion, would promote temperance far more effectually than either pledges or sumptuary laws.

In the News-paper paragraphs to which I referred nothing is said that leads to the conclusion that the experimenters have any correct notions in regard to the power by which these articles produce the effects in question. I consider it as absolutely certain that it is the Euphrenic power of which I am now treating. As there is so much hazard of falling into intemperance, by the use of Alcohol for the purpose under consideration, it may therefore be expedient to give a large portion of the other Euphrenics the preference of it; but it is in vain to deny the power in question, to this agent, since it certainly possesses it in an eminent degree. In addition to this, it possesses other highly valuable and most important powers, of such a peculiar quality, and in such proportions, in combination, that there is no substitute for it in the whole materia medica; so that nothing but ignorance of its real and true powers, can possibly keep it out of use in the practice of medicine. I never happened to be acquainted with any physician, who did not prescribe it very frequently, in some shape or form.

I must be allowed to say in this place, that I never knew intemperance produced by the use of Alcohol as a medicine. Under my observation, patients have been far more liable to acquire

a strong dislike for it, in consequence of their associating with its use, the recollection of all the disquietudes and distresses of the disease, under which they suffered. I have repeatedly known such a disgust for it produced in this way, that the subject never afterwards used in health any of that sort of Spirit, which he took under the disease. Subsequently, under the head of pathological conditions in which the Euphrenics are useful, I shall have occasion to say some thing further that will illustrate what is here stated.

When any person uses habitually and protractedly a great deal of Tobacco, I believe he always eats decidedly less than if he did not use Tobacco at all; but as the article is commonly taken, it does not appear to affect appetite or digestive power, in any manner or degree. I think I have cited examples sufficient, of well known and common articles, to prove and illustrate the normal operation of the Euphrenics, in reference to sleep and food. I deem it important that physicians should understand both perfectly; since it will often save a patient from much suffering, and oftener still from a protracted disease. Some times a counsellor will happen to understand this whole matter, while the physician in attendance does not; and then it is difficult for the former to spend the time to argue-out, and cite facts, to prove the truth, and he leaves the patient to the course on which he found him, though he has absolute knowledge, that a far more useful and beneficial plan of treatment might be adopted. I have very often been called to visit patients in consultation, for whose cases, I judged that Papaver was greatly needed; but the physician in attendance objected to it, on the ground that it would destroy appetite, and impair digestive power. In many instances I could not induce the attendant physician to adopt its use; but in a great majority of the cases in which my advice has prevailed, the Papaver has actually increased both appetite and digestive power, as well as arrested and obviated the particular symptoms for which it was more especially prescribed.

I am not apprised that the simple or pure Euphrenics, ever produce Spasms or Convulsions of any sort, as a part of their ultimate operation. I should not deem it necessary to make this suggestive statement, if I had not heard it inculcated that Spasms or Convulsions were an ultimate effect of Protoxyd of Nitrogen,

which is certainly one of the purest Euphrenics known, though we have many equally pure. I made special investigation in regard to the cases on which this allegation was founded, and became satisfied that it was a mistake. From the supposed exact similarity of the powers of Protoxyd of Etherogen or Common Æther, to Protoxyd of Nitrogen, I have heard it stated that the former would, in all probability, produce Spasms or Convulsions. Now there is in fact a great similarity in the Euphrenic powers of these two articles; but Common Æther possesses two or three other powers in addition to that of a Euphrenic, so that such an article might produce Spasms or Convulsions, when a pure Euphrenic would not. But I believe there is no reason to conclude, that Common Æther ever produces such effects. Certainly if it is capable of producing an Acinesia of any motor nerve or nerves, as much testimony contributes to show, it must be very little likely to be capable of producing Spasms or Convulsions of any sort. I am satisfied that no other classes of medicines, except Narcotics and Erethistics ever produce Spasms or Convulsions, at least as a regular effect.

Do any of the Euphrenics ever prove Acinetic; as well as Anæsthetic, either by their Euphrenic power, or any other which may happen to be associated? It must be observed that when I mention Acinesia, I intend an incapability of motion, having its seat in the motive organs themselves, viz. the muscles, and dependent on some morbid condition of the motor nerves. An incapability of voluntary motion, from a suspension of the power of volition, I should not reckon as a true and proper Acinesia. For example, in exquisite Apoplexy, one side only is affected with a true and proper Paralysis. The other side does not move because there is no volition, but it is no more affected with true and proper Paralysis, than is the whole voluntary muscular system in sleep. Now Coma is the analogue of Apoplexia, it being a mere Acinesia of the hemispheres of the cerebrum, just as Apoplexia is a mere Paralysis of the same organ; and an Acinesia of any other part or organ has the same relation to Coma, that Paralysis of any other part or organ has to Apoplexia. It will be obvious then, that inability of motion or action from deficiency of volition, as in profound Coma, is a very different thing from Acinesia in a part or organ while volition can be exercised in its greatest perfection.

I do not think that an Acinetie power should be expected as a necessary accompaniment of an Anæsthetic power in the Euphrenics, merely because Anæsthesia and Paralysis are commonly associated. I never myself witnessed much, if any thing, which favored the opinion that the Euphrenics are likewise Acinetics. But are not the Euphrenics almost universally reckoned and called Antispastics, or incorrectly Antispasmodics? To be entitled to this appellation they must be more or less remedial of Spasms or Convulsions. If they are ever truly such, it appears to me that they must necessarily be more or less Acinetie. There is in fact much floating testimony that all the most common Euphrenics are capable of suspending Spasms. But beside this, there have certainly been numerous brief statements of late, in the periodicals, to the effect that Common Convulsions, Hysteric Convulsions, and even Tetanus, have been arrested by the inhalation of Tritochlorid of Formicigen or Chloroform, Protoxyd of Etherogen or Common Æther, etc. As these statements have not been much in detail, I have hitherto attached but little importance to them; and yet they have been so numerous that I began to think they must have foundation; and if so, the Euphrenics must be more or less Acinetie.

Within a few years just past, I have been repeatedly informed, by various gentlemen that on trial of Tritochlorid of Formicigen in parturition for the production of Anæsthesia, they had found it suspend the uterine contractions as perfectly as it relieved the pain; but as a compensation for this, it was alleged to favor and promote relaxation, so that at the last, by suffering a single decided contraction, or at most two, the patient was delivered with very little, indeed with scarcely any suffering. One gentleman who at first was, like myself, incredulous of these statements, made trial of the practice, and denied that the uterine contractions were hindered; but after trying it longer, he reported that they were reduced to a slight painless effort that he could hardly call a uterine contraction, but which accomplished the desired purpose apparently in the best manner, but in a way inexplicable (as was said) and imperceptible except by manual contact, and almost equally imperceptible by the patient. The physician declared that both himself and the patient were about equally surprised at the result, and the manner in which it had been accomplished.

This statement immediately reminded me of certain cases that had occurred in my own practice some years previous. A lady upon whom I was accustomed to attend during parturition, commonly suffered extremely in the process—very much more than ordinary. At last I determined to ascertain how much might be accomplished in the way of mitigation by a free use of *Papaver*. Accordingly when called next to attend upon her, I entered immediately upon the administration of opium, at the rate of a grain an hour. As the patient was rather more than ordinarily susceptible to the influence of this agent, this quantity appeared very nearly to suspend the process of parturition and intirely obviated all pain. My plan was to gain time for all the relaxation possible, previous to allowing very decided expulsive contractions. I arrived at the bedside of the patient in the evening; and as she had never got-along in less than twenty-four hours, and sometimes had continued in parturition for a longer time, I determined to prevent uterine contractions as far as possible, at least for the intire night. After the first examination in this case, not suspecting any progress, except in relaxation, and perceiving no expulsive contractions, I forbore to make another till toward morning, the patient thought she perceived some thing peculiar that she did not understand, and accordingly called my attention to it, when to my great surprise, I found the head of the foetus just passing through the os externum, and in a moment it cried-out loudly. The patient was as much astonished as myself, and could hardly believe that she had been delivered. In her enthusiasm, she declared that she would as lief be delivered of a child as drink a cup of Tea. Subsequently I always managed this patient in the same manner, and with the same success; and so I have all other cases that I have deemed analogous, and with equally favorable results. Several of my professional friends have likewise tried this method in similar subjects and cases, and (as they report) have been equally gratified with its effects. Of course I have never explained to non-professional persons through what agency my purpose was accomplished, since there are so many popular prejudices against *Papaver*, and so many sects of Quacks who are constantly exerting themselves to undermine public confidence in well educated physicians.

But it remains to point-out the connexion of this statement with

the Euphrenics. In every case in which I have adopted this method, the Papaver so managed has produced an unusual degree of Euphrænia. Now as its operation in these cases was so like the operation of certain Euphrenics in parturition, as just stated, I strongly incline to think that the effects described were produced by its Euphrenic power, and not at all by its Narcotic power. So far as I could discover, no Narcotic effects at all were produced in any of these cases, but only Euphrænia. The subjects were more than commonly wakeful, not only during the employment, but after the discontinuance of the Papaver, as I believe is usually, if not always the fact, where it has been so managed as to produce the greatest amount of Euphrænia. It should be remarked that all cases did not by any means require the same amount of Papaver, as possibly some may infer from the fact that I have specified only one quantity as employed in a given case. The last case in which I tried it in this way had urgent symptoms when I first reached the bed-side, so that my first dose consisted of a grain of the Sulphate of Oxyd of Morphinum. How much I gave afterwards, I have now no exact recollection, but I endeavored to give enough to prevent all pain; and where any considerable quantity is required, I always repeat my doses at very short intervals.

But whether any of the views, which appear to me to result from the facts I have just stated, are well founded or not, I think we may still ask significantly, if the mere and pure Euphrenics exert no immediate and direct Acinetic operation upon the nerves of voluntary motion, how can they be reasonably expected to be remedial of Tetanus, which they have often been alleged to be? and if they exert no effect of this kind upon the nerves of expression how can they be expected to be remedial of Lyssa for which they have been earnestly proposed? A paroxysm of active and efficient parturient uterine contractions is certainly very strikingly like a paroxysm of Subtonic Spasms, so that if one of them is controlled by one or more of the Euphrenics, the other will be likely to be affected in the same manner; so that the question of the Acinetic power of the Euphrenics will have light thrown upon it by the observation of facts in relation to either. The value of this analogy is confirmed in a certain degree by the fact else where mentioned that those Narcotics which are capable of producing

Spasms or Convulsions as a primary part of their operation, and in the involuntary muscles in preference to the voluntary, are all believed to be Ecboles. I do not think that we are warranted to conclude a priori that agents which diminish susceptibility to sensation must necessarily diminish also susceptibility of contraction. Whether this is true or not can be determined only by the observation of numerous facts. But I have received testimony upon both sides of this question, to a much greater amount indeed upon the negative; but then it did not appear to be founded upon careful and accurate observations, made with this question in view, so that it deserves far less weight than the testimony which I have received on the other side. I can not therefore quite avoid the belief that when the Euphrenics are pushed to the production of full and perfect Anæsthesia, they also produce a greater or less degree of Acinesia, probably more in some of the nerves of motion than in others. Which set of motor nerves however is affected in the greatest degree and which in the least, I am not in possession of observations enough to enable me to determine.

The free, habitual and long protracted use of efficient, but not relatively large quantities of any sufficiently active Euphrenic produces a greater or less degree of Limosis Syncoptica. This disease, as produced by the Euphrenics, is ordinarily manifested by more or less restlessness, general uneasiness and distress (the latter vaguely referred to the stomach) when the subject is not under a greater or less degree of the influence of the agent that produced it; but these symptoms disappear intirely on returning to its use. It is certainly this, and by no means habit, as is so often alleged, that makes it so difficult for the habitual users of Papaver, Wine, Alcohol, and other Euphrenics to relinquish their use, or which prompts them so strongly to return to their employment after an attempt to relinquish it. In all probability, every Euphrenic of any material activity, if used habitually and protractedly, will produce some degree of this peculiar disease, which (with some peculiarities doubtless, as produced by different articles) is the only morbid effect produced by the simple and pure Euphrenics. But I deny that this ever makes any inroad upon the constitution—ever produces any other disease, or contributes to shorten life; at least provided the use of the agent that produced it is continued only in moderate quantities.

There are very few persons who can intirely discontinue the habitual and long protracted use of the more active Euphrenics with impunity after they are about fifty years of age ; even though they may have been used with comparative moderation, and much more if they have been used very freely, though not intemperately, i. e. not so as to make any inroad upon the powers of the constitution, or to shorten life, if continued permanently. The greater the natural vigor of the constitution, the later in life may such use of them be discontinued with impunity ; and the converse of this is likewise true, since I have had repeated opportunities to observe that the less the natural vigor of the constitution the earlier does their continuance, after they have been used habitually and protractedly, become absolutely necessary to the welfare of the system. The foregoing conclusions however, are founded upon the observation of the effects of the two Euphrenics in most common use, viz. Alcohol and Nicotiana. As both of these articles possess several other powers in addition to their Euphrenic power there may possibly be some fallacy as respects my conclusions, resulting from the operations and effects of the other powers. The cases which I have had opportunity to witness, have been mostly laboring men, with no hardihood or positively feeble, who, whenever they were engaged in bodily labor, even from early manhood, always used a moderate quantity of Alcohol, from twice to four times a day, such a quantity as would never have produced any ill effects, had it been continued without interruption. On being persuaded to discontinue this practice, after they were more than fifty years of age, the most serious symptoms occurred, which would speedily disappear on a resumption of a considerable use of Alcohol, much more than would have been necessary for prophylaxis ; and again recur on omitting its use for a certain time. In such cases the system has become accommodated to it, and so fixed in this state of accommodation, that by the age which I have specified, or somewhat earlier or later in different cases, it can not be changed, nor can a life of bodily labor be continued without it, nor can its use be discontinued with impunity. Under such circumstances, I very well know, from multiplied observations of my own, that the intire discontinuance will inevitably be followed by disease, and usually by disease of a very unmanagable sort ; while the continuance of it, with proper moderation,

will preserve the health at its accustomed standard, and will never even in the end, be productive of any injury, but will enable the subject to survive to a good old age, unless cut-off by some acute disease. The foregoing statements are particularly applicable to the use of Alcohol. Those who have used this article only occasionally however, even though much more freely, and perhaps even to great excess, are quite differently situated, and are more likely to get rid of it intirely, not only with impunity but with the greatest advantage.

The disease produced by this intire discontinuance even of a moderate use of Alcohol taken regularly, statedly and habitually, as much so as the person has labored at his regular business, from an early period of life, and continued till he is about fifty years of age or there about (and much more when it has been used immoderately) is marked by the following symptoms and pathological conditions, viz. a failure of the vital energies of all those subordinate parts of the system dependent on the great sympathetic nerve, indicated by a weak state of the stomach, so that when there happens to be appetite, the food taken will oppress the stomach, producing uneasiness, sense of load or weight, Cardialgia, acidity or perhaps pain, and some times intolerance, so that it is liable to be rejected by Emesis; a weak state of the intestines, so that there is either Coprostasis atonica vel Paralytica, on the one hand, or a kind of Diarrhœa on the other, under which though alvine discharges may not happen more frequently than natural, or perhaps not as often as in health, and may not be larger in quantity, they are yet liquid, and their evacuation is attended with the usual symptoms of Diarrhœa; a weak state of the secretents and absorbents or glandular system, so that there is almost constantly a slight, but exceedingly unmanagable Œdema, a weak state of the respiratory function, so that on a little exertion or motion, respiration becomes hurried and oppressed, though after sufficient quiet, it seems to be easy and natural enough; a weak state of the sanguiferous system, so that although the pulse is sufficiently natural as respects frequency and regularity, yet the capillaries are never well filled with red blood, and the patient has more or less of a blanched appearance, often accompanied with a slight degree of sallowness some thing like that of white linen that has been kept a long time without use; a weak state of the

nervous system, so that the patient often has a tottering gait, etc. In short the disease in question seems to be composed of many of the symptoms of Good's Marasmus Anæmia and his Marasmus climactericus, together with some of the symptoms of Struma larvata. The whole of the symptoms above mentioned are not always present in every case, and in particular cases many occur which I have not specified. In this disease there is some times a combination of languor and lassitude with a peculiar slight uneasiness and restlessness which utterly incapacitates the patient for any business. Some times there is a disposition to be dull and dozy (perhaps Lethargic) and yet without any natural and refreshing sleep.

On the discontinuance of such a use of Tobacco, besides its Limosis Syncoptica, there is sometimes a chronic profuse thin secretion from the mucous membranes of the nostrils and fauces which is exceedingly troublesome and which greatly interferes with reading-aloud and with speaking continuously in public. There is some times, in addition to this, somnolency without ability to sleep; some times appetite without ability to take food; some times, a strong sensation of bodily fatigue when there has been no previous bodily exertion; some times a sensation of mental fatigue when there has been no previous mental employment. All of these symptoms are usually relieved gradually but perfectly by a return to the use of Tobacco. What they would eventuate in without a resumption of the Tobacco I know not, as I never saw the experiment of not resuming it. In elderly people, I think there is good ground to fear that the consequences might be serious. I have never seen the effects specified, except in such subjects.

On the omission of the habitual and protracted use of Papaver, beside the peculiar Limosis Syncoptica, there will be the same profuse thin excretion from the Schneiderian membrane which will greatly interfere with reading-aloud and much more especially speaking continuously in public. When other morbid effects in addition to Limosis Syncoptica are produced by any individual Euphrenic, we may be sure that it possesses additional powers. Thus for example Wine and Alcohol are both Euphrenics and both produce exquisite Limosis Syncoptica; but they produce other morbid effects in addition. These are probably due to their other powers.

A very peculiar sort of Limosis Dyspepsia, followed sooner or later by Arthritis Podagra, is one of the chronic sequels of intemperance without intoxication, or of frequent and habitual intoxication with Vinum Vitis Viniferæ; but I do not know that these effects are produced by any other Vinous liquor commonly so called. These effects are undoubtedly produced by the aggregate of the peculiar qualities of this particular Wine; but whether more by its peculiar Euphrenic power than by its peculiar Narcotic power, or its peculiar Antisbestic power or by the whole in conjunction, I know not. All I can say is that no other article possessing Euphrenic power is known to produce any such effects.

Habitual and long protracted tippling (as it is called) as well as frequent intoxication with Alcohol is liable to produce, sooner or later, a peculiar disease of the stomach, which may be considered as a specific Limosis, often, but by no means always, attended with a suffusion of the mucous membrane of the stomach, followed (as is commonly supposed) by a peculiar disease of the liver, of the exact character of which I am ignorant. These effects are some times followed by Hydrops. These are the chronic morbid effects of intemperance in the use of Alcohol, which, as will be seen at once are materially different from the chronic morbid effects of intemperance in the use of pure natural Wine. I do not know that there is any suspicion that the Euphrenic power of Alcohol contributes at all to the production of the chronic morbid effects just described; and it is quite certain that no simple and pure Euphrenic is now known to be capable of producing any thing at all like the effects in question. The chronic ill effects of Wine and Alcohol are doubtless mainly dependent upon the peculiar character of the Euphrenic, Erethistic, Narcotic and Oresthetic powers of these agents; since none of them (except Limosis Syncoptica) are ever produced by any other Euphrenics, Narcotics, etc. and even the Limosis Syncoptica of other Euphrenics is materially different.

Habitual and long protracted tippling as well as frequent intoxication with Alcohol, is also liable to produce sooner or later a very peculiar acute febrile disease, which is commonly, though very absurdly called Delirium tremens. This has commonly been ascribed to the Stimulant power (so called) of Alcohol. But under this term, as I have before said, is commonly comprehend-

ed the Erethistic, Euphrenic, Oresthetic, Antisbestic, and some times even the Narcotic effects of this agent. Indeed Alcohol has but two other powers, viz. those of a Diuretic and of a Diaphoretic. Now no other article, not even Wine, possessing either of these seven powers, or any combination of them, is known to be capable of producing any thing at all like Delirium tremens. All this would seem to show that Delirium tremens is produced by some thing perfectly peculiar to Alcohol, and that this disease can not be occasioned by any of those classes of agents whose powers are possessed by Alcohol. I am inclined to think that it is the Euphrenic power which produces the disorder of the cerebrum and its appendages, the nerves of special sensation and the nerves of voluntary motion, which are the consequences of the habitual intemperate use of Alcohol dilutum in every shape and form.

None of the symptoms which are the result of an inordinate and excessive use of the mere and pure Euphrenics, have any resemblance to those which are produced by a similar use of any other class of remedial agents. I am inclined to think that under the influence of the very active and efficient Euphrenics, there is always more or less exaltation of the susceptibilities of the whole nervous system. This is more obvious however in regard to sensation, than in regard to motion; and I think it is more so in regard to the special sensations, than in regard to common sensation. I do not feel the same confidence that susceptibility of motion is increased, but perhaps it is.

I believe it may be considered certain that the operation of a Euphrenic is considerably more speedy, by inhalation or respiration than by being taken into the stomach. I am suspicious that the operation of a Euphrenic is more transient when taken into the stomach. I know of no reason a priori, why it should be so; but an imperfect knowledge of a few experiments in relation to this point, justify such a position.

When the Euphrenics are administered with considerable freedom, and the patient does not at the same time take a suitable quantity either of some solid or liquid food, they not infrequently produce transient sensations referred to the epigastrium, which the patient commonly compares to faintness, though he admits that they are materially different; transient sensations referred to the stomach, which the patient usually describes by the term

gnawing; and very often that group of symptoms, which is usually termed Vapors. In exquisitely susceptible subjects, a greater or less number of these symptoms will sometimes be so considerable, as the effect of a free use of some active Euphrenic unaccompanied by food, as to interfere seriously with its employment; but when a proper quantity of appropriate nutriment is conjoined, the whole of the symptoms in question are either absent, or they occur in such a slight degree as to be of no consequence.

The preceding is the normal or regular operation of the Euphrenics; but as I shall perhaps be obliged to specify here after, in connection with individual articles, different persons or subjects are more variously affected by the Euphrenics, than by any other class of remedies, at least till they have had occasion to take them frequently and freely. When the system has become accustomed to their use, they operate almost identically in the same manner, on all subjects, however abnormal their effects may have been before the constitution had become familiarized to them. One subject may perhaps experience little or no effect, of any grade or degree, from a given Euphrenic; while others may be quite efficiently affected by it; or in other words, a given Euphrenic agent may affect one person powerfully, and another scarcely at all, irrespective of the existing disease. This seems to be the case with the most active of the pure vegetable Euphrenics. Some subjects seem to be readily susceptible of certain grades of a Euphrenic operation, while they are wholly insusceptible to other grades. So variously are different persons affected, even by the same individual Euphrenic, that some are not exhilarated in the slightest degree by Protoxyd of Nitrogen; though I consider this as altogether the most powerful agent of its class, certainly for every grade of a Euphrenic operation, unless possibly, for its Anesthetic grade. I have had no opportunity of making any very satisfactory observations in regard to the intensity, and the peculiar qualities of the Anesthetic grade of the operation of Protoxyd of Nitrogen. I have often known subjects, that were intirely incapable of the least exhilaration from it, and yet were susceptible of every other grade of its operation.

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As has been already said, there is much reason to think that by oft-repeated use of the Euphrenics, those who are at first abnormally affected by them, may come at last to be affected by

them in the normal and regular way. I have certainly witnessed this quite often from Papaver; and I have received good testimony that the same is true from Wine. But these are not pure Euphrenics; and what may be true of articles possessing so many other powers, may possibly not be true of a simple and pure Euphrenic. Indeed there is such a variation in the peculiar qualities even of the simple and pure Euphrenics, that it is quite possible they may not all be exactly alike in relation to the point under consideration. It is certainly a very curious fact that the operation of the Euphrenics should be so very variable upon individuals not at all accustomed to their use; and likewise that frequent use renders their operations and effects nearly if not quite normal and uniform upon all. A Euphrenic power seems often to require a peculiar sort of susceptibility for its operation, just as *Rhus venenata* requires a peculiar sort of susceptibility for the production of an Erythema vesiculare of the skin. It appears to me to be quite important for the most useful employment of this class of remedies, that all the peculiarities of their operation upon different subjects should be understood, so far as may be practicable, by every one who may ever have occasion to prescribe them.

Upon what subordinate part of the nervous system do the Euphrenics exert their principal operation? It would seem as if the first and second grades of their operation must be exerted upon the nerves of common sensation, since the first consists in the alleviation of one sensation, and the second consists in the production of a new sensation. All the other grades seem to be exerted upon the hemispheres of the cerebrum, since they consist at first in preternatural wakefulness, next in positively augmented activity, as manifested by exhilaration, and after this, suspension of function of a peculiar character. I have always had a suspicion that the Euphrenics, when pushed to a certain extent, affected all the other parts of the nervous system, beside those which I have specified; but if they do I am unable to state the manifestations of it, and we are reminded of the maxim "*de non apparentibus*;" etc. Perhaps they may secondarily produce some thing like an Erethism, as in the voluntary muscular system, under their fullest exhilarating operation. I suspect that the whole nervous system may be in some what such a state under the highest de-

gree of exhilaration. Under the positive exhilaration of the Euphrenics, I believe that there is always an exaltation of the susceptibilities, both of the nerves of common and of special sensation. The great voluntary muscular exertion that is some times made in the grade of exhilaration, is apparently a secondary, and not a primary effect. I do not now recollect ever witnessing any other influence from the Euphrenics upon the involuntary motor nerves of expression, except in the kind of Erethism, with which they seem to be affected, during a strong exhilaration from some article of this class.

The Anæsthesia of the Euphrenics may be, and I think actually is a mere though peculiar operation or grade of operation upon the hemispheres of the cerebrum, under which there is an incapability of that organ to take cognizance of, or perceive pain; and it may possibly be an operation in fact upon the nerves of common sensation, though I once thought not. I took it for granted that the suspension of common sensation which exists in the Anæsthesia of the Euphrenics, is in reality a suspension of the function of perception, one of the faculties of the mind, whose organ is well known to be the hemispheres of the cerebrum. In all probability, (I thought) if the faculty of the perception of pain were not abolished in the Anæsthesia of the Euphrenics, the nerves of common sensation would be found performing their functions as well as ever.

Else where, I mention the ability to dispense with food for remarkably long periods of time, which the influence of the Euphrenics appears to confer, periods of time which, in some cases at least, indeed I think in many, would result in death, independent of the influence in question. As I state else where, this certainly can not be accounted-for by any nutriment furnished by the Euphrenic, since, with the exception of *Theobroma Cacao*, and other species of this genus, none of them furnish any amount of nutriment; and these do not furnish enough to account for the protracted abstinence. I do not think that the effect in question can be accounted-for by any influence of the Euphrenics upon those nerves of common sensation in the stomach in which the sensation of hunger is seated, as some have supposed. The mere absence of hunger can never supply the place of nutriment. Till some one has shown how the mere absence of the sensation of hunger can diminish the

necessity for nutrition, we may rest satisfied with what is alleged to be a fact, viz. that under a certain amount of the influence of a Euphrenic the subject experiences no suffering from any feeling of hunger.

Do the Euphrenics prevent waste of the system by the excretions? My attention has been some what turned to this subject, but I cannot answer this question in the affirmative. No article of this class, so far as my observation extends, diminishes the intestinal discharges, by its Euphrenic power. I know of no mere Euphrenic, that either diminishes or appreciably modifies the renal excretion, I never could ascertain that the excretion of Carbonum from the lungs, or of heat from the skin, is in any way affected by the use of any mere or pure Euphrenic, so that, in the present state of my knowledge, I am constrained to believe that the fact now under consideration can not be explained by any diminution of the ordinary waste by excretion. I do not know how it can be accounted-for, except by a peculiar operation upon the involuntary motor nerve of chiminal action nutrition and reproduction. As this nerve is the one upon which all the actions of the secernents and absorbents, or in other words the glandular system, depends, it might be expected a priori that the function of excretion would be diminished, and consequently the function of ultimate assimilation. That the former is the fact, I know of no evidence; but that the latter must be, would seem to be evident; and yet I can not ascertain that any emaciation happens. It seems however to be well determined, that with a sufficient quantity of some good Euphrenic, perfect health and vigor may be sustained, upon a considerably less quantity of food, than would be positively required without the Euphrenic. This has been verified in France, I believe upon a comparatively large company of manufacturers of the Caucasian race; and it has long been established in South America, by trial on companies, I believe of miners, of the American race. It will be obvious to every one, that there must be a limit and that not very far extended, to the ability to dispense with food with impunity, in consequence of the influence of a Euphrenic; and it would be highly interesting to know about where this limit may be in regard to most persons; for I suppose as a matter of course that it can not be the same in all.

If we knew the manner in which a Euphrenic power destroys

life, we should know much better upon what subordinate part of the nervous system this power more especially acts. It can not be that the Euphrenics destroy life by action upon the hemispheres of the cerebrum, since the functions of the brain proper are not vital functions. If the hemispheres of the cerebrum were to be instantaneously destroyed without any violence or shock to the system, life would not be destroyed. If the position of such a subject were to be changed often enough to prevent gangrene from too much pressure upon particular parts, and food in a suitable state of comminution were to be supplied to the stomach, a man might live-along indefinitely without any proper brain at all. We very well know the manner in which some of the Euphrenics, that possess other powers in addition, destroy life, as for example, Tritochlorid of Formicigen or Chloroform, which seems to extinguish directly and speedily all the powers of the involuntary motor nerve of chemical action, nutrition and reproduction; but this is not effected by its Euphrenic power, but by an intense exhausting power which is perfectly distinct from its Euphrenic power. That I am right as respects the distinctness of these two powers, will be evident if we consider that Protoxyd of Nitrogen is a still more active Euphrenic, and yet is intirely destitute of any degree of exhausting power. Most of the other Ætheres possess both Euphrenic and exhausting powers; but no two of them possess these powers in any thing like the same relative proportions. This is perfectly conclusive that they are different and distinct powers. After all I do not know that this power exerts any influence at all upon the vital parts of the nervous system, viz. upon the nerve of chemical action, nutrition and reproduction, or even upon the nerves of expression which are only indirectly vital nerves.

Many medical gentlemen find difficulty in believing that agents which are capable of producing as positive and decided effects as the exhilaration and Anæsthesia of the mere or pure Euphrenics, can possibly be incapable of extinguishing life. But who has ever been killed by the respiration of Protoxyd of Nitrogen, as freely and as carelessly as it has been used, and that for mere sport? So far as I know, no mention is made of the extinction of life by the Euphrenic in use by the Scandinavian Berserkers. Had its employment been attended with any danger to life, it would assuredly have been avoided. And yet these two are perhaps the most

active of all the articles purely of this class. Certainly this is the fact with Protoxyd of Nitrogen, and I think it is equally so with *Amanita Muscaria*. For a considerable number of years, I have known Protoxyd of Etherogen or Common Æther used for mere sport, just as Protoxyd of Nitrogen is used; and although this article has a certain amount of direct exhausting power conjoined, yet I have never known either harm or hazard from it. If a mere Euphrenic power ever destroys life at all, I think it must be indirectly, I can not conjecture how. The question of the manner in which Euphrenics, as Euphrenics merely, destroy life has become a very important one, since the employment of the *Anæsthesia* or state of insensibility, which they produce, has come into use, for the obviation of suffering during surgical operations.

The preceding definition and account of this class of remedial agents (it should be distinctly understood) is merely a specification of the operations and effects of the most decidedly active and efficient articles belonging to the three great sections of the Euphrenics, viz. the animal-organic; the vegetable-organic; and the chymical-inorganic. The operative effects of the most active and the most powerful of the Euphrænica or Euphrenics, is sufficiently obvious and unequivocal, and leaves no room for doubt or question in regard to the nature and character of their operation. This is certainly true of the Venom of the *Uropsophus durissus*, (*Caudisoua* or *Crotalus horridus*) which may with great propriety be taken as the type of the Euphrenics of animal origin. In all probability the volatile Liquor of *Mephitis Americana* would constitute an equally good type of the Euphrenics of animal origin. It is true also of *Amanita Muscaria* which may very properly be taken as the type of the vegetable Euphrenics. In fact this article is more perfect in all the grades of a Euphrenic operation, than any animal Euphrenic at present known. This is likewise very true of the Protoxyd of Nitrogen which may with propriety be taken as the type of the Euphrenics of chymical origin.

It is by no means the fact however that the operative effects of all the Euphrenics of chymical, vegetable, and animal origin, are equally distinct, prominent and unequivocal in every grade of their operation. So far from it, there is a regular gradation from the most intense, to those of which it is reckoned doubtful, with some of the most judicious members of the medical profession,

whether they produce any effects at all. For example, many consider Castoreum as perfectly inert; while others assert that in a state of peculiar susceptibility, it will most decidedly produce the two first grades of a Euphrenic operation. Among the numerous vegetable Euphrenics, there is also a regular gradation from the most intense, to those of which it is almost doubtful whether they produce any effect at all. In fact, if I were to retain no article among the Euphrenics, except such as I have myself been able to perceive decided, unequivocal and palpable effects from, in my ordinary practice, this class would be comprehended within considerably narrower limits than at present. It is a fact however, that in states of peculiar susceptibility of the system, nearly all the stages of a Euphrenic operation will be most decidedly produced by many agents, which are utterly incapable of producing even a single very obvious grade of this operation upon persons in health or while affected with ordinary diseases. Such a fact justifies a more extended catalogue of Euphrenics than coarser observations and experiments would seem to warrant.

Medical authors and practitioners of medicine constantly write and speak of "that influence over the nervous system, which has led to the use of these agents in various spasmodic" (spastic rather) "diseases; and to their denomination of Antispasmodics" more correctly Antispastics (*See Pereir. Mat. Med. 2d Ed. Lond. 1842, Vol. II, Pg. 1631, Sub. Balsamod. Myrrh.*) This is just about as definite as most medical authors, and most practitioners of medicine, usually are, in regard to the powers, operations and effects of a large portion of the medicines of which they write and talk, and which they employ in their practice. But I have never been able to discover this "influence over the nervous system" etc. from perhaps one quarter of the articles commonly considered as belonging to this class (if indeed, as I have often questioned, they do belong here) even from those in most common and most universal use; and yet the articles are in all probability really capable of producing a greater or less number of the grades of a Euphrenic effect, at least when the susceptibility is more or less exalted, provided the article is pushed far enough. Doubtless those persons who first referred these articles to one and the same class had witnessed these effects. On reference to the catalogue

of articles in the books of materia medica, that are referred to the class called Antispasmodics, we find that Musk, Castoreum, and Valerian may be taken as types of every agent, that can not be obviously and readily referred elsewhere, and that seems to require a special class for its reception. From that group of agents, of which Narthex Assa-fœtida may be considered the type I have never been able to perceive any material "influence over the nervous system," etc. or indeed scarcely any effect whatever; and yet I believe that this group of articles is more universally, and more commonly prescribed, than any other belonging to this class. A similar statement may be made with regard to a large portion of the vegetable articles commonly reputed to belong to this class; but as they are in very general use, by a greater or less number of physicians of high rank in the profession, it is proper that they should all be treated-of, in a course of instruction, or a system of materia medica. If they are not worthy of a place in the apparatus medicaminum, a more thorough knowledge of them will lead to their rejection, on proper grounds; but if they are really and truly valuable a more thorough knowledge of them can not fail of exhibiting their powers, in a decided and unequivocal manner. I am now well satisfied that all these articles are capable of proving unequivocally Euphrenic in a greater or less degree in peculiar exaltations of susceptibility, though they produce no such effects in ordinary circumstances.

This power, though not hitherto recognized as the foundation of a class in the materia medica, is very frequently referred-to, not only by authors, but by practitioners of medicine, and not by any single term but by all of the following fourteen in number.

Formerly the term *Nervina* was oftener applied to this class of agents, than any other denomination, and it is still in considerable use. The term *Nervina* as the name of this class, is exceedingly objectionable on several grounds. It is a Latin and not a Greek word, and it has long been established that the names of the classes should be Greek and not Latin. It is constantly and habitually used with too much latitude to permit its ever being limited and restricted to what I mean by Euphrenics. I have very often inquired of medical gentlemen who used the term *Nervine*, what they intended by it; and the most common reply that I have received has been to the effect, and often in the words that

it is "any agent which soothes the nerves." The term *Nervina* is commonly applied to the sedative effects of the class of agents, which, for want of a better name, I am in the habit of calling *Neuragica* or *Neuragics*. The term *Nervina*, as ordinarily used, is on the whole oftener applied to the Antirritant grade of a Narcotic operation, than to any other remedial effects. Whenever another physician happens to be with me at the bed-side of a patient, I am always in the habit of observing his application of terms referring to the powers of medicines; and I have made many observations in regard to the application of this term. As we much oftener require the Antirritant grade of a Narcotic operation than almost any other effect upon the nervous system, and as the term *Nervine* is applied only to what is vaguely and loosely considered to be a "soothing effect," these facts will explain why this term should oftener be applied to the grade of a Narcotic operation now under consideration, than to any thing else. The first two grades of a Euphrenic operation, it is true, are commonly called *Nervine*; but I never heard this term applied either to the third, fourth, or fifth grade. Physicians might assent to the propriety of applying it to a very moderate grade of exhilaration; but, I think they would revolt at applying it to preternatural wakefulness; and be shocked at the application of it to an exhilaration so intense that the actions of the subject are not under the control of his will; and much more to a suspension of the functions of the hemispheres of the cerebrum; and yet all these are assuredly and certainly only different grades of the operation of one single individual power. But I have been in the habit of hearing every agent or process, that has palliated any immediately urgent symptom, called *Nervine*.

The term *Carminativa* was formerly applied to this class, the next in point of frequency after the term *Nervina*; but at present, as far as my observation extends, it is very much out of fashion. I speak considerably when I say "out of fashion;" for there seems to be no better reason for its disuse. The term *Carminativa* (i. e. acting as a charm is supposed to act) is very often applied to the first two grades of the operation of a Euphrenic; but not to my knowledge to any grade beyond. I am not quite sure that this term is ever intended to be applied to any other operation, beside the first two grades of a Euphrenic operation. The somewhat pungent and somewhat aromatic articles

that are intelligently called Carminatives, are commonly supposed to be moderate Stimulants, as the common language is. But the word Stimulant, in its most limited acceptation as I have so often said, comprises my Erethistics, Euphrenics, Oresthetics and Antisbestics. Now by which of these powers do those articles act, which are called Carminatives? I think by a Euphrenic power, though perhaps somewhat by an Oresthetic power, and perhaps somewhat by an Antisbestic power. But a term so unmedical in its import—one purely Latin—and above all one constantly applied so vaguely and loosely can not possibly be adopted as the name of a class, in any thing like a truly scientific classification of the materia medica founded on the medicinal powers.

The term *Analeptica* was formerly much applied to this class of agents. This term signifies restoration, bringing-back to a former state. What appropriateness then can possibly be in this term, as a name for this class, I am unable to discover. Under my observation, the term *Analeptica* has been almost exclusively applied to the Oresthetics, and to the Antisbestics. The very fact however that it is so often applied both to the Oresthetics and to the Antisbestics, ought to cause its rejection as a name of this class, even if it were more appropriate in signification. It is certainly very far more appropriate to the Oresthetics and the Antisbestics, than to the Euphrenics, even if it is at all appropriate to the latter, which I doubt.

The term *Antispastica* means intrinsically or etymologically some thing which counteracts or contributes to counteract Spasm; while *Antispasmodica* implies some thing which counteracts or contributes to counteract what is like Spasm without being Spasm. But these terms are ordinarily used as if they were perfectly synonymous; and the latter seems to be the favorite. If this class of agents were the sole and exclusive remedies for Spasm, and if there were no other remedies for this pathological condition, the term *Antispastica* (but not *Antispasmodica*) would be appropriate; but I do not know from my own experience that any individual article of this class has any material efficacy in Spastic diseases, or is of any material value in the treatment of any single essentially Spastic disease. It is the Narcotics that are by way of eminence *Antispastics*; but even these are no more exclusively *Antispastics* than they are

anti a hundred other diseases. Upon this plan of naming the classes it would be required that there should be as many classes as there are diseases, and an agent with only a single power might fall under a hundred different classes while a single class might comprise articles with one-half, or three-fourths, or perhaps even the whole of the powers of the intire materia medica. But (as is believed) there are no specific remedies for Spasm. Spasm is of different sorts, and it occurs in quite different associations, and therefore in different cases, requires quite a diversity of remedies. Spasm is quite as often symptomatic as idiopathic; and when it is symptomatic it requires as great a diversity of remedies, as there are diversities of diseases of which it is capable of being symptomatic.

This class, as well as more than one other, has been called *Intoxicantia* and *Inebriantia*, but as I consider, with great impropriety. These two terms however (I can not deny) are constantly applied by physicians generally, both to Exhilaration and to Coma, as well as to several other effects, but without the least appropriateness. I have already given my views of Intoxication or Inebriation under the Narcotics, and therefore I need say nothing further here, except to express my fullest dissent from the propriety of considering Euphrænia or Euphrasia as Intoxication or Inebriation in any manner or degree.

The term *Stimulate* signifies to stir-up, or to hasten with an exhortation, or to goad. The terms *Incite* and *Excite* signify merely to hasten. These terms are assuredly not so appropriate to any power in the materia medica, that they should be retained with so much tenacity, in application to so many different and distinct powers. There are few, if indeed any ordinary practitioners of medicine—few if indeed any authors, who do not apply very different terms to the self same power in the materia medica. I have often heard men who used all the preceding terms (except Euphrænica and Exhilarantia) in application to certain grades of the operation of the Euphrenics, stoutly maintain that all of this class were likewise Incitants, Excitants, or Stimulants. Some consider them as Stimulants of the whole system; some as Stimulants of the whole nervous system merely; some as Stimulants of the hemispheres of the cerebrum; and some as Stimulants of the muscular system merely. But this class of agents

never produces increased vital energy, never produces increased power any where ; which as appears to me, excludes it from the true and proper Stimulants. But I have already discussed this point, and so need enlarge no further upon it, in this place. But these terms are mere Latin, and therefore inadmissible as names of a class of remedies, unless all the names of the classes should be reduced to the same language.

I do not think that the Euphrenics are any more truly *Sedatives* or *Sedantia*, than the Oresthetics, the Antisbestics, and the Tonics are. The true Sedatives are the Antiphogistics, the Leantics, the Neuragics, so far as relates to a part of their operation, and the Narcotics. But even if this class of agents were true and proper Sedatives, neither Sedativa nor Sedantia would be an appropriate name, since there are so many other classes of remedies that are Sedatives. But both Sedativa and Sedantia are mere Latin, and therefore, even if there were no other objection, could not be adopted without an anomaly or irregularity.

Every Euphrenic, that is sufficiently active to suspend the functions of the hemispheres of the cerebrum, is considered as a *Narcotic* (I believe) by all physicians, even though it is utterly incapable of producing any other grade of a Narcotic effect. The medical profession, probably to a man, have no notion that an article can possibly be capable of suspending the functions of the hemispheres of the cerebrum, without being a Narcotic. This however I have heretofore discussed, so that I will now only add that one single solitary effect can never be adopted as the diagnostic of a medicinal class, without leading to extremely unnatural and very heterogenous associations.

Dr. Emmons proposes to call these substances *Soterifics*—a very singular name, half Greek and half Latin, which implies *Made-Saviors*, from *Soter* a Saviour in Greek, and *fio* I am made, in Latin. *Sotericha* is the word that Dr. Emmons should have used, from the Greek Soterichos, a word remarkable for having a *ch* as the initial letter of the last syllable instead of a *k*; but for ought I can see this name would have been as inappropriate as any name could possibly be. A name should be founded upon the whole effects of a power, and not upon one of the most unimportant of an aggregate of effects. I dare say Dr. Emmons had a good reason for this name, but I do not recollect that he assigned

it, and at present, no reason is at all obvious to me. Perhaps he knew how much this class of agents *saved* people from the ill effects of care, anxiety, etc. and employed this name in conformity.

As I have just said the term *Exhilarantia* is a mere translation, and therefore a perfect synonym of the term Euphrænica. It may perhaps be asked whether we need such a translation, and such a synonym; to which I will answer that, except for mere explanation of the term Euphrænica, we certainly do not. The term *Exhilarantia* is objectionable as the technical name of this class of remedies on account of its being Latin, and not therefore in analogy with the long established names of a large majority of all the classes. All of these terms, except the last two, beside being applied to true and proper Euphrenics, are constantly applied to numerous articles not possessing a particle of genuine Euphrenic power.

Since I first distinguished a Euphrenic power from an Antisbestic power, it has been maintained that they are in reality one and the same power, the Euphrenics being Stimulants of the nervous system, while the Antisbestic are Stimulants of the sanguiferous system. Many have deemed this hypothesis as exceedingly plausible. But from the whole of it I totally dissent. I do not think that these two classes have any thing in common in their operation and effects. The Antisbestic produce a quickly diffused and transient increase of vital energy and strength of action in the sanguiferous system, and nothing else. There is no ground for dividing their operation into stages, since there is no variation in it, except in mere degree. On the other hand, we can not predicate strength of action of the Euphrenics, since we have no measure or test of strength of action in the nervous system. In addition to this, a Euphrenic operation consists of several distinct stages, each differing from the other, and not one of them ever observed in the course of an Antisbestic operation. As well might we put any two other classes in the *materia medica* together, and consider them as one and the same. I have very often heard the use of pure Euphrenics strongly objected-to, on account of their supposed actively Stimulant operation. I once heard a distinguished medical professor, denounce *ex cathedra* both Tea and Coffee (pure Euphrenics) as altogether too powerful Stimulants for safe use; and yet, if they are Stimulants, they are of such a

sort as never increase vital energy or strength of action, either in the sanguiferous or any other subordinate system.

The distinction between the Erethistics, the Euphrenics, the Oresthetics, and the Antisbestics is in reality of great practical importance. It can not but be obvious that where a true Antisbestic is strongly indicated, and really required, the substitution either of an Erethistic, a Euphrenic, or an Oresthetic, would wholly fail of producing any beneficial effect, and would often allow a perfectly curable case to prove fatal. During the prevalence of that malignant epidemic sometimes called Typhus Syncephalis in the County of Hartford, Connecticut, between 1806 and 1810, the most active Euphrenics and Oresthetics were very thoroughly tried, where Antisbestics were indicated, and in fact under the notion that they were actually Antisbestics, with nothing but utter disappointment. If the vital power was waning when they were first entered-upon, it continued to wane, and to become extinct, in defiance of all that could be taken of any of these agents. As we became better acquainted with this disease, we were abundantly satisfied that many cases which failed speedily under these articles, might have been easily saved by true and genuine Antisbestics, such as Alcohol for example. Indeed so superior was the effect of this latter article to that of every other agent, that very few died, when this was taken freely from the very beginning of the disease.

When a Euphrenic is indicated, it will be plain that there would be a total failure as respects obtaining any operation or effect desired, if an Erethistic, Oresthetic, or Antisbestic should be substituted. When an Oresthetic is indicated, it must be evident that there would be utter disappointment as respects all of the desired effects if either an Erethistic, a Euphrenic, or an Antisbestic, should be employed. An Antisbestic, an Oresthetic, and perhaps a Euphrenic, might possibly be substituted for an Erethistic; but each of them would be decidedly less eligible, when an Erethistic is truly indicated. It is then, of great practical importance to have clear and definite notions in regard to the distinctions between these four classes of medicines.

What are the pathological conditions that the Euphrenics are the most capable of relieving, and for the relief of which they are the best adapted? There is a peculiar state or condition of a cer-

tain part of the nervous system, very much resembling that which precedes an attack of Typhus nervosus, which is indicated by sensations commonly referred to the epigastric region, or some times more particularly to the stomach, which has a considerable resemblance to Limosis Syncoptica, accompanied with great languor and lassitude, some times with Agrypnia, and often with considerable Dysphoria. These symptoms vary very greatly in intensity, in different cases, and are often so considerable as to constitute a serious indisposition. Under their gravest form, they incapacitate their subject for any business. Just such a state or condition of a certain part of the nervous system is produced, and that very frequently, by the harrassing, prostrating, and exhausting effects of the toil, fatigue, cares, anxieties, and vexations of the necessary and unavoidable business of civilized life; as well as by the exposures, privations and hardships of barbarous and savage life. For this state or condition, the Euphrenics are the only appropriate, the only effectual remedies. This state or condition they always mitigate, relieve or obviate wholly and intirely; and by so doing, they truly contribute not only to comfort, but to the preservation of health and even to the promotion of longevity.

The Euphrenics are often correctly said to obviate fatigue, to prevent, or to satisfy hunger, and even to supersede the necessity for sleep. All this they will assuredly perform, for a certain length of time, longer or shorter in different cases. No articles except such as possess a Euphrenic power have ever got into general and permanent use, among those not positively the subjects of disease, with any tribe or nation of the human races; and no tribe or nation has ever been found in so low a state—a state so near brute-animals, as not to possess at least one if not more of such articles. To this, it is said that not even the aborigines of New-Holland, or of any of the contiguous Islands, nor the Bushmen of Southern Africa are an exception. In proportion as nations are advanced in civilization and refinement, and elevated by intelligence, the number of these articles in common use becomes multiplied. This is what we ought naturally to expect, since the cultivation of natural history leads to their discovery. The very fact then, that an article has come into general and permanent use, among those not positively affected with disease, is

of itself a sufficient evidence that such article is Euphrenic, and that it possesses the power of obviating the peculiar state and condition of a certain portion of the nervous system which I have just described.

It is well known by many, what relief, refreshment and comfort the toil-worn and seemingly exhausted traveler derives from a sufficiently strong infusion of the parched cotyledons of the seeds of *Coffea Arabica*, or a similar one of the dried seeds of *Paullinia sorbilis*. It is well known by many, how both of these preparations enable him to recover with remarkable rapidity and even perfection, not only from his bodily fatigue, but also from his mental cares and anxieties. All our late explorers of the Indian territories (so called) as well as of California and Oregon, bear testimony to this operation of the former article, and seem as if they could not be too lavish of its praises, under such circumstances. The latter article is so highly esteemed for the same purpose, that it has been called the "panacea peregrinationum." If we can rely upon testimony, *Catha edulis* produces similar effects, and *Erythroxylon Coca* still more eminently. It is then undoubtedly the fact that the mere and pure Euphrenics, such as *Thea Sinensis* and *Coffea Arabica*, so well known among us, if their infusions are made of sufficient strength, and taken in sufficient quantity, are highly useful for the mitigation and obviation of the "wear and tear" that inevitably results from the employments, irritations, disappointments and burdens of society. I do not think that there is room for doubt that these articles so used are highly salutary and eminently healthful; and that even much greater service might be rendered by them, if every one had skill to select a pure article, and judgment to adapt the strength of the preparation used, and to regulate the quantity taken, by the real exigencies of the case. Spontaneous reparation under such circumstances is always gradual, and often slow; and except in peculiarly vigorous subjects, it is liable to be more or less imperfect. Reparation by the Euphrenics is usually speedy and certain; and except in extreme cases, complete.

Some of the Euphrenics that possess other powers in addition, are as effectual as those that are pure; and it is not infrequently the fact that their other operations and effects are not contraindicated, even if they are not needed. *Vinum Vitis Viniferæ* seems

to be an article of this character. It is very effectual as a Euphrenic, and its Antisbestic operation is not contraïndicated, nor its proximate or primary Narcotic operation. As it is a comparatively bulky article, in proportion to the degree of its power, all that most persons would incline to drink at once, would not be liable to produce, either Ultimate-Euphrænia or Ultimate-Narcosis. I have often seen very beneficial effects from a stated use of good Wine in persons who could not be said to be the subjects of positive disease. It was a kind of maxim with ancient physicians, that "Wine is the milk of old age;" and I believe there is much truth in it. I never knew an old man in whom the bodily and vital powers had begun to fail or give-way from age merely, to try the stated use of Wine without advantage. Under such circumstances I have often prescribed it; and when the prescription was followed, benefit always resulted. But Wine is thought by many, at the present day, to be too liable to abuse, to be advised in this way. For myself I do not by any means think so. In my whole professional life, I never knew a man fall into any thing like confirmed intemperance, or be in the least danger of it, from such a use of this article. Such a thing I consider as intirely out of the question, unless the subject has been previously intemperate in the use of Alcohol. In fact, I never knew but one single instance of confirmed intemperance upon Wine alone, so that I consider the danger of it as exceedingly small. For certain classes of persons, factitious restoration, under these circumstances, by the smoking of Tobacco (exceptionable as I consider that article) is greatly preferable to the slow gradual and often imperfect process of nature. The arguments that are usually brought against this factitious reparation by Euphrenics, are equally applicable against their use in positive and unequivocal disease, if indeed the line can be drawn with any precision, between the circumstances and conditions to which I have reference, and actual disease. If we may not with propriety obviate by Coffee, Tea, Guarana or Wine the languor, lassitude, uneasiness, restlessness, etc. of great bodily or mental exertion or toil, why should it be proper to stay a Diarrhoea, or to subdue Neuralgia with Papaver, or to suspend an Intermittent with Cinchona. As appears to me, both sets of cases rest upon precisely the same grounds. We may say of Euphrenics as an author has said of books, viz. "they

help us to forget" (and endure) "the crossness of men and things, and compose our cares and our passions and lay our disappointments asleep." "The delicate machinery of the nervous system has a severe ordeal to pass through in the wear and tear of life." (Pg. 87, 88, '*Curious and Costly Books, Salad for the Solitary*' by an Epicure, New York, 1853.)

It is very nearly a universally prevalent opinion that the inclination or desire, under certain circumstances, for such Euphrenics as Erythroxylon Coca, Cannabis Indica, Thea Sinensis, Coffea Arabica, Paullinia sorbilis, Catha edulis, Theobroma Cacao, Ilex Paraguayensis, Nicotiana Tabacum, etc. is merely, purely and exclusively a factitious appetite, produced only with the greatest trouble and difficulty, and finally adhered-to, only as a matter of protracted and inveterate habit. Nothing can be wider from the truth—nothing can be more false, than such an opinion. The inclination, indeed the desire for these articles is as natural to us, as is languor and lassitude, care and anxiety, fatigue and exhaustion, etc. If none of these articles, and no other Euphrenic had hitherto been discovered, the inclination and desire for them would have been no less than it now is, provided the constitution of society and its pursuits and employments had been the same that they now are. If neither these, nor any other Euphrenics had ever been known, the world might not have discovered what it wanted; but the want would have existed just as much as it does now. I have no doubt that to the discovery and use of these and other Euphrenics, the world is in a good degree indebted for many of the most important works of art, many of the most successful efforts of genius and intellect; and in short, for a good degree of the advancement of the present period, in every thing that is useful and ornamental to man. The use of the Euphrenics has contributed to this effect in an important degree by mitigating and obviating the infirmities of many men of the greatest abilities, which, unrelieved, would have made the subjects of them altogether incapable of any great effort, and would have rendered life a burden and talents useless. Many such infirm subjects, by the aid of the Euphrenics "are now" (in the words of a medical author) "either speaking in the Senate, exciting emotion on the stage, or producing works which rival those of antiquity." Again, the use of the Euphrenics has contributed to

this same effect in quite a different manner. This class of agents (as a distinguished literary gentleman says of one of them) "are the only articles, that go into the mouth, which may be considered as luxuries of the mind." "It is wonderful" (continues this author) "how" (these articles) "clear a man's head, and give him command over his intellect." (*G. P. R. James, "A Whim and its Consequences," Ch. III, Pg. 6, New York, 1848.*)

If we may rely on testimony, some splendid literary, and some profound scientific works, have been composed and written under their influence, and by valetudinarians and invalids, who would have been incapable of such effort and exertion without the important aid of some Euphrenic. At the present time, it is impossible to estimate the hindrance to the advancement of mankind in civilization and the useful arts, in literature and science, in morals and even in Christianity, that must have inevitably resulted from inability to relieve and obviate that condition which consists in languor, lassitude and exhaustion, resulting from care and anxiety, toil and fatigue, (as already fully specified and described heretofore) in any more expeditious way than they would be relieved by the slow and unassisted efforts of nature. Without the ability to do this, many of the greatest benefactors of the world, who have happened to have feeble constitutions and infirm bodies, could never have accomplished any thing in comparison with what they have actually done. I repeat, that civilization, morals and even Christianity, depend much more upon what we eat and drink, than has perhaps ever yet been supposed; and in a way too, in which the ascetics, and mortifiers of the flesh, have never thought of. Some author (whose name I have irretrievably forgotten, though his name merits recollection) has maintained (and I doubt not with perfect truth) that a starving and otherwise suffering people, never yet made any material advance in civilization; never yet produced any great works in art, literature and science, and never yet advanced in a moral and truly Christian character. Plenty, and above all comfort, are necessary to all these things; and any material degree of positive misery is incompatible with them.

On account of what I have just stated, I consider that a much higher degree of importance is to be attached to the Euphrenics, than to any mere medicinal class of agents. They have the value

of articles of daily requirement, when there is no disease; articles of diet, as well as of medicine. Most of the pure Euphrenics are very little, if at all liable to abuse. Some of those possessing other powers in addition are much more so. But this liability to abuse, in the case of a few of them, constitutes no valid objection to the whole—affords no reason why this class of agents should be intirely rejected. The best things are always liable to the greatest abuses; and if we were to reject utterly every thing that is thus liable, how much that is valuable would finally remain to us? In this life it was clearly intended that we should some times be in a state of temptation and trial; from which I conclude that we are not bound absolutely to reject every thing which can possibly be misused; but have a right to accept and employ with proper moderation and due restraint, all the gifts which God has bestowed upon us. Temperance does not consist so much in total abstinence from any thing, as in such an employment of it, as shall be useful and salutary.

The Euphrenics are peculiarly valuable in the incipient infirmities of age. It seems almost as if they had the power to arrest the natural progress of decay. I have known a few instances of persons who had never used Tea, Coffee, Wine or Alcohol, till their constitutions began to be impaired from age, which impairment, I believe, took place earlier than in subjects who had used these articles in the ordinary way all their lives. The adoption of the use of Tea, Coffee, etc. at the period in question, by these persons, produced quite remarkable effects, relieving in a surprising manner the incipient infirmities. It is necessary to remark here that the Tea, Coffee, etc. which is used for such a purpose must be genuine and of good quality and must also be prepared of sufficient strength. I do not think that as inferior an article as the black varieties of Tea can be relied-on for such a purpose. The factitious or adulterated and refuse stuff, so much of which is now sold and employed in the U. S. A. and the very weak infusions that are drank by so many, who are no judges of the genuiness or the quality of these articles, can not be expected to answer the desired purpose. The cases to which I refer, were rather wealthy subjects who knew how to obtain good articles, and took care to purchase no other. As I have already quoted, it was said by the ancients, that “Wine is the Milk of old age.” This max-

im was doubtless founded upon the observation of facts similar to those which I have just described. I doubt not then, that a judicious use of Euphrenics, even from early life, contributes to ward-off, and postpone very many of the early infirmities of age, and also to mitigate their intensity, to a greater or less extent in numerous subjects.

But the Euphrenics, if used in this way, must be used temperately. Tea, Coffee, etc. are not liable to an intemperate use—indeed they can not well be used intemperately, and the same is equally true in all probability of *Erythroxylon Coca*, *Paullinia sorbilis*, *Cathia edulis*, etc. and most likely also of *Cannabis Indica*. But great caution is necessary in regard to such a use of *Vinum Vitis Viniferae* and Alcohol, or intemperance will be the result. Never the less the Wine producing countries of Europe, where light or weak Wines are almost the sole beverages in use by all classes of people, are the most temperate regions of the world. It seems that when light or weak Wines are so cheap as to be obtainable by all—cheaper even than Tea, Coffee, etc. they are always greatly preferred to every other beverage, and have superseded every other; and being so bulky in proportion to their strength, no body wishes to swallow a sufficient bulk of them to do any injury, or to amount to intemperance. In addition even to this, there seems to be far less liability to intemperance in the use of the pure natural Wine of *Vitis Vinifera*, even when it is the strongest, than in the use of any other intoxicating beverage; and when a person has acquired a relish for pure natural Wine, he seldom if ever has a relish for any other inebriating liquor.

The Euphrenics have a very considerable reputation (and I think a just one, at least to a greater or less extent) as prophylactics of epidemic and endemic diseases, but more especially of the former. Not that every Euphrenic however feeble, can be relied on for this purpose; but I think that such a prophylactic operation is truly exerted by a Euphrenic power, and that if a Euphrenic effect is only intense in proportion to the intensity of the epidemic predisposition, there will not be a failure of its prophylactic operation, oftener than medicinal effects in general are liable to fail. It is well known to physicians that *Nicotiana Tabacum* has long had the reputation of being a prophylactic of epidemic diseases. As it is ordinarily employed, I do not suppose

that much if any confidence is to be reposed in it, for this purpose; and yet I do not think that it is intirely without any effect of this sort; though I doubt not it should be used much more freely than common to be worthy of serious reliance. I do not believe however that Tobacco is a very good Euphrenic for this particular purpose. Its Narcotic, Emetic, and Cathartic powers (to say nothing of its Adenagic power) must interfere with its being pushed to the necessary extent to answer the desired purpose, in most cases.

Though apparently little is to be expected from it a priori, I have never the less received good testimony in favor of the prophylactic efficacy of *Coffea Arabica* in epidemic and endemic diseases. Under peculiar circumstances, a lady deemed it necessary that she should remain in a very sickly city, during the prevalence of a malignant and very fatal epidemic, which, as it proved, affected a greater proportion of the inhabitants than usual, who did not flee to some healthful country place. This lady had some where imbibed the opinion that a sufficient quantity of strong Coffee might be relied-on as a prophylactic of such an epidemic, and she determined to give it a thorough trial under her circumstances. She understood that as ordinarily taken, little or nothing could be expected from it, and she determined to take it in such a manner as to get its most intense effects. This lady happened to be wealthy and could therefore command the very best article that the country afforded. She herself superintended the parching of the article, and had it prepared in the proportions of some where between two and four ounces of the Coffee to a pint of Water; and she used a well digested infusion instead of a decoction. Such a preparation she made her sole beverage, not only with her food, but at all other times. At first under such a use of such a preparation, she slept considerably less than usual, and also took much less food; but becoming accustomed to it, she soon slept and eat enough, though less than she had been accustomed to do. Coffee prepared in this manner she employed freely during the whole prevalence of the epidemic, and she never had a single day's indisposition during the whole time. The next epidemic which occurred within two or three years, this lady again determined to remain at home and her children resolved to stay with her; but disbelieving the utility of the Coffee in their

mother's case, they refused to take it. Several of them sickened, and some died, though the mother in constant attendance upon them, escaped all indisposition. A few years afterwards another just such epidemic again prevailed; and this lady, with the survivors of the family again remained in the city. She adopted the same course as respects the Coffee, and escaped all indisposition, though every survivor of her family who did not use the Coffee, sickened in succession and died. Since that time, she has once more remained in the same city, during an other epidemic, and adopted the same course, and again escaped sickness. She is now said to be a hale woman of about eighty years of age.

The epidemics of which I have been speaking were not pure epidemics, but a disease produced by the joint agency of both an epidemic and endemic influence. That the Coffee employed by this lady was full as active as I have described, and perhaps more so, I can not doubt, since I have been informed by two or three individuals, who had casually taken a cup of it, that it seemed as if they should never sleep or be hungry again. The effects were described as being truly intense, more so than was supposed possible by those who had never before taken any other Coffee than such as is in common use. It may perhaps be said that this case proves nothing. This I readily admit; and yet it makes it highly probable that the Coffee produced the effect attributed to it. I believe that every agent, which has ever had the reputation of being a prophylactic of any epidemic, has always had a greater or less degree of Euphrenic power. A sufficient number of such facts as these, even if they did not absolutely prove any thing, would soon satisfy the public, medical as well as non-medical, that the Euphrenics are well worthy of use, for the purpose in question. It is quite likely that some other simple and pure Euphrenic, that would admit of being pushed to any extent that might be desired, as well as Coffee, would be preferable to Coffee. If I am right in the opinion that *Erythroxylon Coca* is considerably more active than *Coffea Arabica*, this article might deserve the preference. I have been informed that *Paullinia sorbilis* is more active than *Coffea Arabica*, and if such is the fact, this article would deserve the preference. *Catha edulis* is alleged by some (but how truly I know not) to be more active than *Coffea Arabica*; and it has the reputation of being prophylactic of epidemics. It is quite

possible that this article may deserve the preference of Coffea. Some of the idiopathic and independent Neurotica in which the Euphrenics are capable of rendering greater or less service are the following, viz.

Dysphoria simplex and *Dysphoria Anxietas*. A proper amount of some active Euphrenic is often capable of relieving these two affections.

Agrypnia pertasa. Inability to sleep is often capable of being obviated by just the right quantity of a sufficiently active Euphrenic. I suppose that too much of one, would produce its own preternatural wakefulness.

Dyspnœa exacerbans and perhaps *Dyspnœa continua*. I have sometimes known intense *Dyspnœa exacerbans* speedily arrested by an active Euphrenic.

Pedesis Singultus. I have often seen a very troublesome idiopathic Singultus perfectly relieved for the time being, by one of the active Euphrenics.

Entasia Hysteria. Whatever may be the value of the Euphrenics in positive Hysterical-Fit, I consider it certain that they are some times efficacious for the relief of Hysterical predisposition, which consists, in part at least, of a peculiar and specific morbid susceptibility, with an equally peculiar and specific morbid mobility.

Certain Euphrenics (as would seem from their being called Antispasmodics meaning Antispastics) must have long had more or less reputation for the relief of *Spasms* or *Convulsions*, though I never knew a practitioner of medicine that ever placed any reliance upon them for this purpose. I have always supposed that they must have acquired this reputation from the efficacy of some of them for the relief of predisposition to Hysteria; but perhaps more especially from the great efficacy of Papaver for the relief of *Spasms* or *Convulsions*, which article is commonly mentioned under this class of agents, though (so far as I know) it is usually believed that it relieves *Spasms* or *Convulsions* exclusively by its Narcotic power. Since a few Euphrenics have come into use for the production of Anæsthesia under surgical operations, this condition has been some times produced, and as is alleged, some times with benefit, under *Spasms* or *Convulsions*. It does not appear to be recognized however, that the power which produces Anæsthe-

sia, is the same which has long been called Antispasmodic or rather Antispastic. As it happens, I have been informed of a considerable number of cases of Spasms or Convulsions, in which the production of Anæsthesia has been tried, but rendered no service. Such cases are not usually published. A priori, I should not expect the least benefit in such cases from Anæsthesia.

Spasms or Convulsions have their seat exclusively in nerves of motion, and they consist exclusively in vitiated motion or action. In fact, they are usually confined to the muscles of voluntary motion. How a suspension of the function of common sensation should be of any service under such circumstances, I can not well discover; and as the balance of testimony in my possession is greatly against it, I must still be allowed to doubt. However, as nothing is infallible, cases of failure might be expected, even if this method of treatment is truly a good one, and therefore I will hold myself in readiness to assent to it when the authority in its favor sufficiently preponderates.

Carus Lethargus. I have seen Lethargy perfectly obviated for the time being by an active Euphrenic.

Acinesia Coma. I have known the Euphrenics relieve a strong tendency to Coma, or perhaps an incipient degree of this affection, when not connected with a phlogistic condition. Some of them have the reputation of relieving even profound Coma.

Acinesia Ganglii semilunaris. Dr. Herzka states, in the German Journals of New York, that he has employed Common-Æther by inhalation in Sun-Stroke with uniform success. (*N. Y. Observer, Thursd. 8th Sept. 1853.*) The only disease to which I have ever known the name Ictus Solaris or Sun-Stroke applied, has been a greater or less degree of suspension of the functions of the great Semilunar ganglion in the center of the Epigastrium, and of the great Sympathetic nerve, which is derived from it, produced by inordinate bodily exertion under great heat of the sun. This disease I have been in the habit of denominating *Acinesia Ganglii semilunaris*; and I have been in the habit of considering it, as in part exhaustion. Now I have no belief that a mere Euphrenic power can render any service in such an affection. What possible benefit could result from any grade of a Euphrenic operation? I have seen this disease treated by various physicians, and never with any material or unequivocal success,

except by a comparatively free use of Brandy for the time being. Now if Common-Æther has any tendency to produce Acinesia of any portion of this nerve, and much more especially if it ever contributes to produce any exhaustion of the powers and energies of this nerve generally, as it certainly does some times, I should not think that it would be a very eligible remedy for the disease in question. Any case of this disease benefited by this Æther, as appears to me, must have been very trifling. If any case ever has been benefited by it, I think it must have been done by its Oresthetic power. Perhaps it has a sufficient degree of this power to render it adequate to relieve moderate cases. No degree of this power could cure the worst cases, that are really curable by Brandy.

Is the peculiar Erethism of a Euphrenic capable of being substituted, in Therapeutics, for the Erethism of other agents, as of the simple and pure Erethistics for example, such as Ignatia amara, Strychnos Nux-vomica, etc.? or in other words, can a Euphrenic (of sufficient power) be employed, with the desired remedial effect, in any case, in which Erethistic effects are indicated! There are many accidental and unessential symptoms, of various diseases, which are capable of being relieved by the Euphrenics, that are liable to occur in diseases, over whose essential symptoms, either individually or in the aggregate, they exercise no control. It will at once be obvious that they must be appropriate for the relief of languor and lassitude not connected with a phlogistic condition of the system. They some times relieve mental inactivity and mental depression when not connected with entony. I have seen benefit produced by the Euphrenics in a variety of other cases, both idiopathic and symptomatic, which I shall not attempt to specify in this place.

Dr. Lessep undertakes to assign the reason why so many persons among every tribe and race of men throughout the habitable world, are addicted to the use of one or more of that class of articles which I call Euphrenics; and I think he has been exceedingly unfortunate in his specifications. Much the largest number of persons employing some Euphrenic habitually in civilized and refined communities, did not first enter upon its use, because they had any need of its effects, but merely in consequence of associations with, and enticements from others, who had long employed it—so true is it that “evil communications corrupt good man-

ners." This use they continue till a certain degree of the Limosis Syncoptica of the article taken is produced, and then they have not the resolution to discontinue such use, even though convinced that there is no reason whatever why it should ever have been entered upon, and now why it should not be immediately abandoned. A considerable number of persons employing some Euphrenic habitually and protractedly, first used it very properly on account of some constitutional infirmity; or on account of some chronic disease subject to frequent exacerbations; or on account of some chronic disease in acute exacerbating and remitting paroxysms. Never having taken the Euphrenic with any uniformity as respects doses and periods of repetition; above all never having taken any care that the quantity employed should be carefully adapted to the real exigencies of the case; and at all events, never having taken care that no more than was necessary to meet the symptoms and pathological conditions was used, such a degree of the Limosis Syncoptica of the article employed is produced (which would not have happened, if no more than was really proper and really required had been taken) that the subject prefers continuing the employment of the article to the inconvenience, irksomeness and disagreeableness, which for a longer or shorter time, would result from its discontinuance. Thus the article is continued perhaps for the remainder of a long life, under the notion that it is quite necessary to the comfort at least, and even to the health of the subject. At the outset of these cases the Euphrenic is actually indicated—perhaps actually required; and if only taken and managed in the best manner, might have cured the disease, at least in most cases; but taken by persons not skilled in the most appropriate—the best mode of management, it is used in such a manner as to render only transient and fugitive benefit, the medicine all the while slowly losing remedial power and the system losing susceptibility to it and the patient gradually acquiring the peculiar Limosis Syncoptica which it produces, so as to be constantly prompted to its continued use.

I have never yet had opportunity to investigate a case of what is commonly called "Opium-eating" for example (and I have investigated a considerable number) in which some preparation of the Poppy was not clearly and unequivocally indicated, and in fact required at the outset of its use, and in which the patient did

not become what is called an "Opium-eater" because the Poppy was badly managed. Papaver in doses irregular as respects size and as respects periods of repetition very seldom contributes much toward the radical cure of any serious malady, while it is very liable to produce a troublesome degree of Limosis Syncoptica, and tends strongly toward the production of what is called Opium-eating and other undesirable effects. This mode of management often makes larger doses necessary, than it is convenient for most patients to take. In a case of Chronic-Diarrhœa (one of the most prevalent chronic diseases of the times) nothing can be relied-on for its cure, except some preparation of the Poppy; but whether a cure is actually effected or not, depends wholly upon the manner in which this agent is managed. For success, a patient should take a dose sufficiently large to arrest the Diarrhœic discharges for a certain time and yet not large enough to produce any inconvenient or disagreeable effects, and a new dose should always be given before the desired effects of the previous one have wholly passed-off. Managed in this way, a cure will be accomplished after a longer or shorter continuance of the remedy and without Limosis Syncoptica or any undesired operation whatever. If the dose is of just such a size as to restrain the Diarrhœic discharges for about three hours and a half, and the doses are repeated every three hours, this method will suit a great majority of cases. Under this method regularly and accurately continued, smaller and smaller doses will be needed to produce the same amount of effect, while the disease is regularly and steadily abating, till it is perfectly cured. In this way, I have often cured cases radically, with less than half the amount of Papaver that the patients had taken previously without any material benefit, or at least without any that was permanent. Under such a course as this, the medicine appears to increase in remedial power, and the animal system in susceptibility. Should the repetition of the dose be omitted till all the desired effects of the previous dose have passed-off, and more especially till the Diarrhœic discharges have recurred, no cure would be effected; and if the use of the remedy is continued long enough, such a degree of Limosis Syncoptica will inevitably take place, as will make it exceedingly difficult to get rid of the Papaver. Just so it is, to a greater or less extent, with other Euphrenics.

The great difficulty of suspending the use of an active Euphrenic, which has been employed freely and protractedly must be ascribed to the Limosis Syncoptica which it produces. No force of mere habit, of ever so long continuance, can be put in competition with this disease as produced by Alcohol for example. This pathological condition as produced by each individual Euphrenic, doubtless has peculiarities in quality as well as variations in degree. The former we can not describe intelligibly, but the latter we may ascertain and specify. As caused by Alcohol, it is probably stronger in degree and more peculiar in quality than as produced by any thing else. As produced by Papaver it is perhaps next in strength to that of Alcohol. As produced by Wine it is less intense and much more easily overcome than that of Alcohol. After that of Papaver the Limosis Syncoptica of Nicotiana, I believe is most intense and most difficult to overcome of any Euphrenic in common use in this country. As produced by those Euphrenics used in foreign countries as *Amanita Muscaria*, *Erythroxyton Coca*, *Cannabis Indica*, *Paullinia sorbilis* or *Guarana*, *Catha edulis* or *Khat*, etc. the intensity of this disease is probably in proportion to the intensity of the different grades of Euphrenic operation produced by each article respectively; though upon this subject I can form no opinion from experience and observation or from testimony even, in regard to any of them.

I have no knowledge that the use of any Euphrenic is commenced and much less subsequently continued as a mere matter of sensuality. There are however no simple and pure Euphrenics in common use among us except Tea and Coffee in Dietetics. Tobacco has several other powers which limit and restrict its use as a Euphrenic, and there are other objections to it as I have before stated. A great majority of the habitual users of Tobacco, of whom I have made the inquiry, were inticed to its use by their companions or associates. Occasionally it had been recommended as a medicine by those who knew nothing of disease or its remedies. A few had commenced its use at an early age because they thought it manly; and all had continued it till it had produced its peculiar Limosis Syncoptica, after which they had not the resolution to abandon it. Both Wine and Alcohol possess other powers for which they are usually prescribed in medicine; but I never knew their habitual and intemperate use to result from

their employment in medicine. I never yet knew a habitual and protracted use of *Papaver* which did not result from its ill management in diseases in which it was truly indicated. The facts may be different in other countries—I speak only of our own.

The aboriginal Peruvians who have been so barbarously enslaved by the Spaniards in their own country, and so inhumanly overtaken and otherwise ill-treated, use *Erythroxylon Coca*. In their circumstances it is really a necessary Analeptic or Restorative, without which they would hardly be able to tolerate the labor imposed upon them. Travelers tell us that all which prevents despair and revolt among those employed in the mines, is their being allowed a free use of the *Coca*. It would hardly be correct to say that they use it as a matter of sensuality.

The peculiar quality of the Euphrenic power of Wine and Alcohol, more especially the latter, is such as to render them highly exceptionable for common use; and besides, they possess other powers that are undesirable for this purpose. The great evils of intemperance as it exists among us would be in a measure obviated if we had some of the simple and pure Euphrenics, of somewhat greater power than Tea and Coffee for common use, as substitutes for Tobacco, Wine and Alcohol.

Ever since I arrived at a knowledge of a Euphrenic power, and the application of its several grades in the treatment of various diseases I have felt the want of some pure and efficient article of this class, which can be easily and cheaply obtained and conveniently managed, and which, from its possessing no other power, can be pushed to any extent necessary for the production of the highest degree of Euphrasy ever required for medicinal purposes. Hitherto no such article has been in common use among us, or has been capable of being commanded at all times at least. The Protoxyd of Nitrogen is sufficiently efficient; but the fact that it can be used only in the state of Gas, and by inhalation solely, together with the inconvenience of obtaining, transporting and administering it, must preclude any thing like its common use. I saw such use of it attempted in Hartford, Ct. in the year 1809, and with a degree of ingenuity and perseverance that merited success; but in vain.

Musk is the only simple and pure Euphrenic of any material

efficiency that has always been kept in the shops where I have resided; but its very high price, and its great liability to be adulterated, amount to a prohibition of its use. I never could induce any employer that I ever had to be at the expense of it long enough to allow me opportunity of personally observing how many grades of a Euphrenic operation it is capable of producing. I do not now recollect ever observing any effect from it, beyond the production of the calm placid and pleasant sensation. I can not well doubt however that it is really capable of producing preternatural wakefulness of the peculiar sort resulting from Euphrenics generally, and probably also a greater or less amount of exhilaration.

I always believed from testimony that Coffee might be made useful in medicine as a Euphrenic, if it were only of sufficiently good quality—recently and properly prepared—made sufficiently strong, and taken in sufficient quantity, and in the manner in which such medicines should be taken, viz. in uniform doses, and at regular and short intervals, a new dose always being taken before the effects of the preceding one have intirely passed-off. But I never could get any body to make any Coffee as it must be made for medicinal purposes; though I have often made the attempt. All, and every body have invariably supposed that the routine method, commonly employed in making it for the table, is the sole manner in which it is possible to make it—the sole manner in which it can possibly be made so as to be any way palatable. Even if I could have induced any body to make Coffee as it must be made, to be worth any thing as a medicine, I have no belief that I could have induced any body to take it in such a manner as to be of any benefit. I have often made the attempt, but intirely without success. The best Green Tea (so called) is undoubtedly sufficiently active to be turned to a very useful purpose in medicine, as a Euphrenic; but so numerous also have been the prejudices in regard to its preparation, and employment, that I have never been able to induce any body to take it in such a manner. The prejudices in regard to it were even more numerous, and more inveterate, than in regard to Coffee.

Till within a few years previous to the present time (1850) Cannabis Indica has not been obtainable in the shops of this country generally. There seems now to be a prospect of its being regu-

larly kept in New York; so that we are likely to have the command at least of a single Euphrenic of considerable efficiency; and for my part, I am inclined to study the article, and to avail myself of it, in the practice of medicine. It appears probable to me that much of the discrepancy of testimony and consequent diversity of opinion in regard to the powers, operations and effects of Cannabis Indica, are due to diversities of susceptibility to its influence in different subjects. If this is true, we ought to apply the same principle to the explanation of the diversities of opinion in regard to the powers, operations and effects of other Euphrenics; and we ought to bear in mind the opinion held by some, and certainly true in some cases, that becoming accustomed to the use of these agents, gradually obviates these peculiarities of susceptibility, in various subjects; and sooner or later, renders their operation nearly identical in all.

|| If I am correct as to the fact that Amanita Muscaria is a simple and pure Euphrenic, I am inclined to think that this ought to take the precedence for common use, of Cannabis Indica. Amanita Muscaria is indigenuous to New England—is easily recognized and discriminated—can be taken as well in infusion, as in any other form—would seem to produce the several grades of a Euphrenic operation in such proportion as to be easily managed for all the medicinal purposes of a Euphrenic—and is (as I believe) capable also of producing an Anæsthesia sufficiently complete for the performance of all surgical operations. It is my present belief however that more than one species—perhaps several—are comprised under the denomination of Amanita Muscaria, in the most commonly received works on botany. This ought to be carefully investigated; for if the fact is as I suppose, these different species may have a diversity of powers, and thus occasion disappointment in regard to the medicinal effects.

For the period of about eighteen years while I was connected with the schools, and for several years after, I was in the habit of inculcating, both in my public and private instructions, all that is contained in this Proëm in regard to the Euphrenics. During the whole of this time I could never induce any established physician to bestow attention enough upon the subject to enable him to understand what I taught, and to refute or confirm it, as his judgment should dictate. But in a work (as I now believe) enti-

tled "Annals" (perhaps "Annual") "of Scientific discoveries," by David A. Wells, Boston, 1852, pages 222, 223, we find certain things in relation to the Euphrenics, which, so far as they are well founded, I had been in the habit of inculcating upon my pupils for a considerable number of years. If I do not mistake Dr. Emmons proposed a name for the small group of articles which he specified, very anomalously formed from the Greek word for *Savior*. I recollect being surprised that he did not adopt the classical Greek word *Sotericha*. But why these articles should be called Savior medicines, or even salutary or healthful merely because they enable a person to dispense with food with impunity for an unusual length of time, I can not discover. All medicines when judiciously applied and skillfully managed are salutary or healthful. I think that a name derived from some other more important operation of this class, should be preferred; and I can not but think that the term Euphrænica is better.

Dr. Emmons says "individuals accustomed to Tea, and using large quantities of it, take comparatively little food, and yet perform as large an amount of work as if they took the full quantity of nutriment." He says that "Opium-users consume but little food." (*Pg. 222, 223, Ann. Scient. Discov. for 1852, by Dav. A. Wells, M. D. Boston, 1852.*) He says "inebriates take but little food for weeks, and some times perform considerable work." (*Ibidem.*) Dr. Eminons mentions a doctrine of the present day that aliments are nutritious in proportion to the amount of Nitrogen which they contain, in comparison with the other elements that enter into their composition. He enumerates Tea, Coffee, Opium, Porter, and Alcohol, as articles that supply the place of food, without furnishing nutriment. (*Ibidem.*) He thinks that these substances "which do not furnish nutriment, do some thing in its place," and asks "do they prevent waste?" These are evidently glimpses of some of the properties of the Euphrenics. These observations of Dr. Emmons require no comment, since I have already treated as fully upon this subject as the present state of my knowledge justifies me in doing.

I am strongly inclined to believe that a large number of the fetid articles (commonly so called) possess a greater or less degree of Euphrenic power, and are capable of being used for this purpose, except when they have some other power that would inter-

fere with such use. There is a certain portion of the articles called Aromatics, whose true powers, operations and effects, authors upon the *materia medica* seem to have found it difficult to ascertain. Hooper says that Aromatic is "a term applied to all medicines which have a grateful spicy scent, and are agreeably pungent to the taste." As appears to me Hooper's definition might be much amended by a change of two words, I think it should read thus, viz. Aromatic is a term applied to all medicines which have a grateful fragrant scent, and an agreeable spicy taste. Aroma, say the lexicographers "*eximie odoramentum est.*" There are very many articles that are quite fragrant to the smell, and at the same time quite spicy to the taste, without a particle of pungency; while on the other hand, there are many pungent articles (as *Arisæma atrorubens*, for example) which are exquisitely so, without the least fragrance or spiciness. Pungency may indeed be possessed by an Aromatic, but it is an accidental, not an essential quality. Perhaps even spiciness may not be absolutely necessary to an Aromatic, since some articles, to which this name is commonly applied, have very little of it. I should think that the essential Oil of Roses might be considered as a simple, a pure and an uncomplicated Aromatic, in what I consider the correct and legitimate acceptation of the term Aromatic.

The Aromatics are very generally called Stimulants; but there are very many articles to which the term Aromatic seems to me to be truly applicable, which have no power, even in the smallest degree, of increasing vital energy and strength of action, either in the heart, the capillaries, or any other part of the sanguiferous system. Such an article, it will be obvious, can not then (at least with any propriety) be reckoned a true Stimulant. The truth appears to be, that the portion of the Aromatics to which I refer, really and truly possess that power which I have been in the habit of designating by the term Euphrenic, and this seems to be their essential and characterizing power, whether it happens to be considerable or trifling in degree. Some of the Aromatics, very evidently possess no other different and distinct power. Such of the Aromatics as happen to be quite pungent and acrid to the taste, but are still destitute of all power of increasing vital energy and strength of action, either in the heart or any part of the

sanguiferous system, really possess that power, which I have been in the habit of designating by the term Oresthetic; and this seems to be the most obvious and characterizing power, whether it happens to be considerable, or trifling in degree. Some of the Aromatics very evidently possess no other different and distinct powers, beside that of an Oresthetic, in addition to that of a Euphrenic.

Nothing is better known than that a powerful and exquisitely fragrant and agreeable odor will produce all the grades of operation, or very nearly all, of a Euphrenic, upon highly susceptible subjects at least. Intense perfumes some times produce even the very best medicinal grade of a Euphrenic operation, viz. Anæsthesia or insensibility to pain, which is commonly, but incorrectly mistaken for Syncope. The insensibility to pain produced by the Euphrenics, under which the most painful surgical operations can be performed, without pain or inconvenience, is a state very widely different and distinct from Syncope (which it has some times been called) and also very different from Lethargy, Coma, Apoplexy, etc. It appears to be a suspension of the functions of the hemispheres of the cerebrum, sui generis, as I have elsewhere inculcated. There are peculiar circumstances under which the Euphrenic effects of pure Aromatics (in the acceptance in which I employ this term) may be perceived by any one. Let a person have a severe, intense, and protracted attack of the disease commonly called Sick-Head-ache. After the continuance of this disease for thirty-six or forty-eight hours, attended with utter inability to take food for the whole time, and with frequent and violent vomiting, for the last half of the time, let the disease come to a sudden and perfect termination. The languor and lassitude which will follow such an attack, will always be extreme, and the general susceptibility will not infrequently be very greatly exalted. Under these circumstances, if any very highly fragrant, but at the same time simple and pure Aromatic is only inhaled in a considerable quantity, all of the languor and lassitude will suddenly disappear, and the subject will often be so much exhilarated as to be suspected of incipient intoxication, by those not acquainted with the actual facts. Doubtless it was the state of insensibility constituting the last medicinal grade of a Euphrenic operation which gave rise to the well known line of poetry,

"Die of a Rose, in aromatic pain."

The question arises here, very naturally, whether all pure Aromatics (in the acceptation in which I use this term) are not all Euphrenics? In my opinion they are so, provided they are pure Aromatics of sufficient intensity. Again, as I have already said, some of the Aromatics very evidently possess both Euphrenic and Oresthetic powers, and no other. It is true that Diaphoretic powers are commonly ascribed to most, if not to all Euphrenic and Oresthetic Aromatics; and it is difficult to decide whether they do, or do not possess a true and proper Diaphoretic power, since if they are not immediately and directly Diaphoretic, they are almost always indirectly so.

There are some Aromatics, which are undoubtedly Narcotic, as the kernel of the fruit of *Myristica officinalis* (Linn.) Whether this article is Euphrenic or not, is not perhaps accurately ascertained, but I have confidently supposed that it is. Whether there are any of the Aromatics, that possess the power which I am in the habit of denominating Antisbestic, i. e. true Stimulant, or the power of producing a peculiar quickly diffused and transient increase of vital energy and strength of action in the heart and the rest of the sanguiferous system, I know not; but I have commonly supposed that there are some Aromatics, which do actually possess this power; and that the kernel of the fruit of *Myristica officinalis* is one of them. There are many of the Aromatics that are commonly reckoned and employed as mere and pure Diaphoretics; and in the ordinary pharmaceutic preparations of the crude articles, they may be such, and such only; but I imagine, if their active principles, were to be employed in a separate state, there would always be a manifestation of other powers.

There is no natural group of medicinal agents, that is more in need of thorough, accurate and complete investigation, than the Aromatics, though there are many other important groups that are very much in the same condition. As it is my intention however, to specify only a very limited number of the Aromatics in connexion with the medicinal class of Euphrenics, I trust I shall have no material difficulty in selecting such as are really and truly Euphrenics. I think then, that all the exquisitely fragrant articles—all genuine and intense perfumers of every sort, are more prominently Euphrenic than the fetid articles, which have so long been universally received as such. The influence upon the hu-

man system of the fragrant exhalations of flowers has been well known and expressly recognized time immemorial; but as a Euphrenic power has never hitherto been understood, the effect in question has always been confounded with a Narcotic operation. Nothing is more common than allusions to, and the recognition of the effects to which I refer in such terms as the following, viz. "the senses were overpowered by the delicious Narcotic fragrance exhaling from the flowers." (*Vide Retribution, or the Vale of Shadows, [a Novel] by Emma D. E. Nevitt Southworth, N. Y. 1849. Harper & Brothers, Publishers, Ch. XX, Pg. 97, Col. 2, Lines 8, 9, 10.*)

An author says that "during the clear stillness of the night, there is often a strong odor in the air, the flowers giving-out their perfume more liberally to the cool" (and moist) "night air, than to the warm" (and dry) "air of day;" (and then) "a kind of faint sensation crosses over the system, under the overpowering sweetness which exhales from the flowers, and a languor tending to painful imaginings" (comes on) (*See G. P. R. James's Last of the Fairies, Pg. 21 and 22.*) The preceding is probably more practical than correct, and is probably an allusion to a certain amount of Euphrenic operation, though the term languor should not have been applied to it, unless perhaps at the beginning of Anæsthesia. Another author says that "The magnificent flowers at the South—Magnolia grandiflora, and many others—are now beginning to be generally in bloom; but the scent of these is strong, and too powerful for my taste." "The scent of the woods is overpowering and not wholesome." "Ladies of delicacy become flushed, and suffer from riding through the woods at this season." "The flowers" (rather the odors) "operate on them like poison." "To me they appear suffocating." (*Frederika Bremer, Homes of the New World, N. Y. 1853, Letter XVI, Pg. 356.*) I think this is an other rather incorrect allusion to a Euphrenic operation and one but a trifle short of Anæsthesia.

Dr. Benjamin Smith Barton says that "the flowers of Magnolia glauca or Beaver Tree have a powerful, and to most persons, an agreeable smell." "It is an emanation, which must be considered as a potent Stimulant or Incitant." "I am well acquainted with a physician in whom the newly expanded flowers evidently increased the paroxysm" (probably exacerbation) "of a

Fever, which came-on every afternoon" (qu. ? Hectic) "and also increased the pain of Inflammatory Gout" (N. B. All Gout is Inflammatory in the sense of consisting in Phlogosis or Inflammation; but no Gout is ever Inflammatory in the sense of Phlogistic or Entonic; so that this epithet is here wholly useless, and therefore superfluous.) (*See B. S. Bart. Collect. for an Essay toward a Mat. Med. of U. S. A. 3d Edit. ? Philad. 1810, Part. 1, Pg. 13.*) To the preceding Dr. B. S. Barton adds, in an appendix, that "the room in which the flowers of *Magnolia glauca* produced these effects here mentioned, was not a small one, and was well aired." "It was in the month of June," (*Apend. to Part 1 of Mat. Med. Pg. 47.*) The same author says further, that "the late Mr. S. P. of Philadelphia was always affected with a sense of great uneasiness about his chest" (thorax) "and with a strong tendency to fainting" (Anæsthesia doubtless) "whenever he entered a room where the flower of this *Magnolia* was." *Ibidem.*)

It must be recollected that writers on the *materia medica* always confound Erethistic, Euphrenic, Oresthetic, Antisbestic and often also Narcotic effects, under that vaguest of all terms in medicine, viz. Stimulant; so that it was to be expected that Dr. B. S. Barton should apply this term, in this class. He says that "these are interesting facts," and so indeed they are, since they contribute to illustrate the Euphrenic effects of the perfume of flowers. These perfumes seem to produce Anæsthesia, with a slight and transient degree of the preceding effects. These are scarcely noticed by the patient, as no such operation is expected. The symptoms of the immediate approach of Anæsthesia always produce alarm, and the Anæsthesia itself is reckoned to be fainting. I have repeatedly been informed that the strong perfume in the air, during a morning or an evening within the tropics, not infrequently produces a "hysterical insensibility" in susceptible subjects. This is exactly the Anæsthesia of a Euphrenic. Very susceptible persons are some times overpowered by the powerful perfume of a conservatory, into which a great number of plants in full bloom are crowded, and are thereby thrown into a state of insensibility, which is a true Anæsthesia of the Euphrenics. This state has been described to me as a very peculiar sort of fainting, in which a certain amount of consciousness was retained. The same effect is some times produced by a considerable number of plants in

bloom, in a close sleeping room. I have some times heard this same effect complained-of, from a single large plant of *Nerium odorum* in a close room during a summer evening. Under such circumstances, it is commonly ascribed to some thing supposed to be poisonous in the exhalation from the flowers of this plant. I do not think however that its flowers are any more poisonous than any other equally fragrant ones.

The following is a remarkably good popular account of *Anæsthesia*, as produced by strong perfumes. I have heard the *Anæsthesia* of Protoxyd of Nitrogen and Protoxyd of Etherogen described in almost the same terms. "One day when I was walking in a garden in the environs of Libson, inhaling the balmy air in an alley of superb *Magnoliæ* and *Palmæ*, then in full bloom, the gardener made-up for me a large bouquet in which he placed four or five of the flowers of the *Magnolia*." "On my return home with my bouquet, I felt an unusual drowsiness." "I went to bed having first placed my flowers in water, and placed them on a table near my bed-side, that I might enjoy their delicious perfume." "When I lay down, the drowsiness with which I had been oppressed appeared to leave me." "My blood circulated with extreme violence, and my pulse beat as if I had been in a fever." "I was for a considerable time exceedingly restless, but at length I fell into a profound and heavy sleep." "As I had retired to-bed very much fatigued, my husband desired the servants not to disturb me the next morning." "However, at eleven o'clock, finding that I had not been called, he himself came into my apartment and opened the shutters, while my little daughter climbed upon the bed to embrace me." "But as soon as the light came into my room the child uttered a shriek." "I was almost suffocated." "My husband instantly threw-open the windows." "My faculties were so completely suspended that at first he supposed me to be dead." "However, there was no contraction of the features indicative of suffering." "I was deathly pale and my teeth were so firmly closed, that, on coming to myself again, I could hardly separate them." "My eye-lids were very much swollen." "I had lost my sense of hearing, and was in a state of imperfect insensibility." "My husband raised me in his arms and carried me into the balcony." "The air caused me to give signs of life; but it was not till Magnien" (a physician) "had

it must have been a Euphrenic, since nothing destitute of this power is ever used in this manner. However I am by no means satisfied that it was not some species of *Nicotiana*. The Greeks and the Turks commonly use *Nicotiana rustica*, because (as is said) it is much milder than *Nicotiana Tabacum*. I am not apprised however that it is at all Aromatic. But this term is very differently understood by different persons. *Nicotiana Persica* is likewise much used in the East. It is reputed to be mild and peculiarly fragrant; but this word is applied as variously, by different persons, as the word Aromatic. I am not aware that the stems of either of these species are ever employed for smoking, though doubtless they would be milder, or, in other words, less active than the leaves. The chopped stems of *Hyoscyamus albus* are said to be some times smoked in Greece and Turkey for the relief of pain. Of course they are Narcotic, but not to my knowledge Euphrenic. At least I consider it certain that *Hyoscyamus niger* is not Euphrenic; and it is most probable that both of these species are alike in their powers, operations and effects. Lient. Lynch's book contains internal evidence that he is not a botanist, as much as the works of a New England lady poet, who writes regarding [the "cones" of *Pistacia Terbinthus*, and various other things in botany, equally authentic. Even some popular American writers expressly upon botany, very evidently do not know the difference between order, genus, species and variety; and therefore Lient. Lynch educated exclusively for the navy will be excused for not being a botanist.

There is considerable reason to suspect, if not to believe, that the principal elements of ordinary vegetable substances, during a certain preparation by heat, often combine in such a manner, as to constitute certain compound principles, which possess a Euphrenic power. It is well known that certain seeds often, and certain roots occasionally, become decidedly Euphrenic, by parching as we parch Coffee. This process, in some cases would seem to produce the Alcaloid Coffeina, when as yet there is no evidence of its previous existence, though it must be confessed that this compound principle exists independent of any such process, in a greater number of different and distinct plants, than any other Euphrenic principle at present known. I have already noticed the fact that the active principles of Tobacco are supposed not to ex-

ist in the plant as it grows, but to be formed in the dried leaves by a peculiar process well known to be essential to the peculiar qualities of the article as it is actually used. It is said that by a peculiar mode of preparation even the leaves of *Zea Mays* (*Linn.*) may be made to produce all the effects of *Nicotiana Tabacum*, which I call Euphrenic, and that a patent for the process has been obtained.

Lycoperdon Proteus (qu.) is said to be an Anæsthetic. Before this is admitted, we should inquire whether previous to its supposed Anæsthesia, it produces the first four grades of a Euphrenic operation, or the first three grades of a Narcotic operation? We should also inquire whether the supposed Anæsthesia is a true and genuine Coma, or such a suspension of the functions of the hemispheres of the cerebrum as takes place in Hysteric Fit? Still in addition to this, we should inquire whether this article ever produces any of the symptoms that constitute Ultimate-Narcosis, and particularly whether it ever produces Spasms or Convulsions of any sort? It should likewise be ascertained whether it is capable of destroying life; and if it is, in what manner; and particularly whether it does it by suspending the functions of either set of nerves, by which the Narcotics destroy life. If this article proves to be a Narcotic, it is not likely that the state of insensibility which it produces, will be found sufficiently intense for the performance of a surgical operation without pain, since, so far as is at present known, no Narcotic produces a Coma sufficient for this; unless such Coma is a fatal one. I have known some attempts to use the Coma of a Narcotic for the performance of some trifling operations, but always without success. The operation always dispelled the Coma at once. The *Fungacæ* (as I think) certainly produce a considerable number of Narcotics on the one hand; and on the other, one very active and doubtless pure Euphrenic, a Euphrenic capable of producing a very intense Anæsthesia.

When all questions in reference to the true power or powers of *Lycoperdon Proteus* are answered and determined, its natural history will then require attention, and it will then be necessary to answer the question, what is *Lycoperdon Proteus*? Sprengel recognizes no such species; but to as many as four of his species, he gives *Lycoperdon Proteus* as a synonym, viz. *Lycoperdon*

Echinatum (*Persoon*), Lycoperdon Ericetorum (*Persoon*) Lycoperdon Excipuliforme (*Scopoli*), Lycoperdon Pyriforme (*Schaffer*.) All of these species of Sprengel (and I believe some others) were reckoned by Bulliard as mere varieties of his Lycoperdon Proteus. Perhaps all of these are active. If they are, it is so much the better for the *materia medica*. If only one is active, which is it? This is by no means a trifling or unimportant inquiry, since an intense, and at the same time, a perfectly safe Anæsthetic, one whose stage of exhilaration is slight and transient, so as not to be at all troublesome, is still a great desideratum in the *materia medica*.

PROËM TO THE CLASS ORÆSTHETICA.

The term Oræsthetica is compounded of a Greek verb signifying "to arouse; to stir-up; to awaken; to excite," etc. (*See Donnegan's Lexicon*) and a Greek attribute signifying "susceptible: sensible;" etc. (*Ibidem*.) The term Oræsthesia, which I use for the effects of an Oræsthetic, is a compound of the same Greek verb, and a noun-substantive, signifying "susceptibility; sensibility;" etc.

Definition.—Oræsthetica are articles which, when taken internally, act primarily and immediately upon the mucous membrane of the alimentary canal, and by textural sympathy upon all the other mucous membranes, viz. the Schneiderian, the oral, the faucial, the bronchial, the uterine, the vaginal, the vesical, the urethral, etc.—*in the first stage of their operation*, changing action and condition, in a peculiar manner, in all these membranes; on the one hand, obviating torpor and insusceptibility and deficient activity, i. e. in a word prostration; on the other hand, obviating morbid irritability and morbid sensibility, i. e. in other words, morbid susceptibility, and also irritative activity; relieving laxity and spongy turgescence; increasing deficient secre-

tions, diminishing excessive ones, and favorably changing vitiated ones, when connected with prostration and atony, and not with phlogistic diathesis; disposing Aphthous affections and other ulcerations to heal; and producing a positive augmentation of healthy susceptibility; if pushed, *in the second stage of their operation*, occasioning a preternatural and sub-morbid degree of irritability and sensibility, i. e. susceptibility; if pushed still further, *in the third stage of their operation*, kindling into action a Phlogosis or Inflammation of an Erythematic sort; if pushed still farther, *in the fourth stage of their operation*, occasioning ulceration and supuration; if pushed still farther, *in the fifth stage of their operation*, extinguishing vitality, i. e. producing Gangrene; and where no other different and distinct powers are conjoined, without any other different and distinct effects.

It must be particularly remarked that as medicinal agents, the Oresthetics are used internally only for the first degree of their operation, the production of the second degree being always undesirable, and the last three degrees constituting morbid, or (as they are popularly called) poisonous effects. When applied externally they produce the same effects upon the skin, which they produce upon the mucous membranes, when taken internally. It will be perceived that according to my definitions, the operations of the Oresthetics proper and the Epispastics are the same, with the exception only, that the Oresthetics proper are always internal remedies producing their primary and immediate effects upon the mucous membrane of the alimentary canal, while the Epispastics are always external remedies producing their primary and immediate effects upon the dermatic membrane of the surface of the body; and that the Oresthetics proper are employed only for the first degree of their operation, the production of the second degree being almost always undesirable, and the last three degrees, when produced internally always constituting morbid or poisonous effects; while the Epispastics are used for nearly every degree of their operation. An Epispastic operation then, is an Oresthetic operation exerted upon the skin, instead of a mucous membrane; and this was a case in which, in the capacity of an instructor in a public institution, I was induced, by the mighty importance attached to it, by certain medical gentlemen, to found two classes upon one single and individual power, so far as I can

discover, for the mere pupose of retaining the name Epispassic for a class, instead of a sub-division of a class. It is true that upon my own plan we are obliged to have sub-divisions such as Antipsories, Rubefacients, Vesicants, Escharotics, etc. according as the article most readily produces Antipsorasis, Rubefaction, Vesication, Escharosis, etc. Epispassics effects therefore are always Ultimate-Oresthetic effects exerted upon the external surface of the body.

It is more or less doubtful whether the first two grades of an Oresthetic operation are of any service in medicine when exerted upon the skin, though I am inclined to believe that they are the operations by which many cutaneous diseases are cured. I consider it quite certain, for example, that Sulphurum elementarium is capable of producing the first two grades of an Oresthetic operation upon the skin. Now by what power does Sulphurum cure Scabies, and various other cutaneous affections, unless it is by means of its producing the first two grades of an Oresthetic operation. Uniprotosulphate of Zinc is capable of producing the first two grades of an Oresthetic operation, and it is also capable of curing Scabies and other cutaneous affections, by external application. Now I esteem it much more probable that these cures should be effected by the first two grades of an Oresthetic operation, than by the Neuragic and Styptic powers of this article, these being the only powers within my knowledge, by which it can possbily cure such diseases. I could mention a great number of agents that appear to operate in a manner perfectly analogous to these, but two will suffice. Though my belief is as here stated, I shall not enumerate, under this class, any of the articles that produce no other grades of an Oresthetic operation, except merely the cure of Scabies and other cutaneous diseases by external application to the skin.

It will be observed that the third, fourth, and fifth stages only of a Oresthetic operation constitute what are commonly called Epispassic effects. The last three grades of the operation of an Oresthetic, when it is taken internally, I shall hereafter designate by the compound term Ultimate-Oræsthesiis. When applied externally to the skin, it is only the fifth and last grade of their operation that can be reckoned as Ultimate-Oræsthesiis, the third and fourth grades constituting the two grades of an Epispassic ef-

fect, for which the Oresthetics are chiefly applied externally or to the skin.

It must not be supposed however that the operation and effects of the Oresthetics are confined to the mucous membranes and the skin, to which they are immediately applied. So far from it, they actually affect nearly the whole system in a greater or less degree, as they affect the parts to which they are applied. This appears to be accomplished by means of the several sorts of sympathy heretofore specified and defined. Although the primary and direct operation of the pure Oresthetics is upon the mucous membrane of the alimentary canal; and although there are no indications (at least in ordinary cases) of their ever directly affecting either the circulating or the nervous systems; yet when they are so freely taken, as to operate efficiently, they certainly appear to affect directly, and at the same time, all the other mucous membranes, as the Schneiderian, the oral, the faucial, the bronchial, the vaginal, the uterine, the urethral and vesical, as will be abundantly obvious in many of their diseases. But it is believed that they affect all the other subordinate parts of the system, beside the mucous membranes, in an indirect and secondary manner. At all events their operation upon all parts in which their effects are ever manifested, is intirely unlike the operation of any other class of remedies.

The Oresthetics affect the circulating system in a peculiar manner however, since some of them at least, and I believe the greater part, are quite effectual for restraining Atonic Hemorrhage of certain sorts, though they accomplish this, without either increase or diminution of vital energy and strength of action.

Many of the Oresthetics too, affect in an equally peculiar manner, the secernent and absorbent systems, as is evident by their operations in certain Dysthetica, particularly some of the constitutional symptoms of protracted Syphilis, and its sequels.

The Oresthetics likewise affect the nervous system in a peculiar manner, since some of them are quite effectual for the relief of pains, Neuralgic, Rheumatalgic, etc.

Are the pure Oresthetics at all Aphrodisiac under any circumstances? I am inclined to think that when used regularly and protractedly, many of them do actually produce a greater or less degree of this effect. I think I have seen decided relief of Agen-

esia Impotentia from some of them used as above specified. I have also been informed by patients under the use of Oresthetics for Rheumatalgia vera, that they experienced an unequivocal Aphrodisiac operation. Taking it for granted then that the Oresthetics are Aphrodisiac, is the operation a peculiar distinct and separate power, or is it an effect of a mere Oresthetic power? I think it is unquestionably the latter, which is a conclusion to which I have arrived through many facts, of which I have had satisfactory testimony. There are several other powers that produce a greater or less degree of Aphrodisia, but I know of no separate and distinct Aphrodisiac power. The evidence that there is no independent Aphrodisiac power consists in the fact that there is no Aphrodisiac operation separate from these several other powers above referred-to.

Ever since my first distinctive knowledge of the Oresthetics, I have always supposed that all the morbid effects of a protracted intemperate use of Alcohol upon the stomach and liver (what is called Limosis Syncoptica excepted, if indeed this affection has its seat in the stomach, as its name implies) are intirely due to the Oresthetic power of Alcohol. This may however be an incorrect conclusion, since I have no knowledge of any other Oresthetic, that ever produces any such effects. Still I am inclined to think that the effects in question, are never the less due to the peculiar qualities of the Oresthetic power of Alcohol. It is necessary to mention this subject in this place, but it will be more fully considered under Alcohol.

There is no power in the materia medica, which is perhaps so widely various, as possessed by different articles, as that which I am in the habit of calling Oresthetic. It varies almost endlessly in degree; but its variations in quality are not only far more numerous, than in any other class, but also far more prominent and far more striking. It is doubtless by a variation in the qualities of an Oresthetic power, that most external topical remedies cure cutaneous diseases.

It would seem as if the primary and more especial medicinal operation of the Oresthetics must be exerted upon that part of the nerve of chiminal action, nutrition and reproduction, that is sent to the secretories or excretories of the mucous membranes and of the skin, or perhaps to the capillaries of these textures. They af-

fect also the nerves of common sensation of these parts ; but this portion of their operation does not appear ordinarily to be medicinal. In some cases however, when there is morbid sensibility, they contribute to its obviation, and thus prove medicinal to a certain extent, by their operation upon nerves of common sensation. In several cases when there has been a failure of the functions of the nerves of expression and respiratory motion, I have irritated the organs dependent on these nerves into renewed action, after a perfect cessation, by the administration of Oresthetics. This I have done in a given case, perhaps a dozen times in succession. The action thus produced would continue some times five minutes, some times ten, fifteen, twenty, or even thirty, and then be again suspended. I do not certainly know that I ever absolutely saved a case in which there was this sort of failure of function, by Oresthetics ; but I have temporarily restored respiration by their operation, a considerable number of times after I was unable to do it by any other means. When respiratory motions begin to cease from fatal doses of Opium or any preparations of Papaver, I have been far more successful in reproducing them by means of the Oresthetics, than by any other agents. It is my opinion that they are actually preferable to every thing else, except factitious respiration, for this purpose. All this the Oresthetics accomplish by impression upon the mucous membrane of the mouth, fauces Œsophagus and Stomach, or upon the skin over the organs to be irritated into action. They are more effectual applied to the former parts, than to the latter.

The essence of the operation of the Oresthetics appears to consist mainly in the increase of susceptibility when it is deficient ; improvement in its quality when it is vitiated ; and diminution of it when it is morbidly excessive ; and when the article is a pure Oresthetic, without any increase or diminution of vital energy and strength of action in any subordinate part of the system, the former of which so many physicians seem to expect. But though the Oresthetics increase susceptibility to the medicinal operations of remedies generally ; yet they do not do this in reference to many of their ultimate, excessive, inordinate or poisonous operations. For example though in appropriate cases, they increase susceptibility to the Antirritant, Anodyne, and Soporific operations of the Narcotics, yet they diminish susceptibility to an

Ultimate Narcotic-operation. In short the operation of the pure Oresthetics is as eminently and as unequivocally and decidedly alterative as any other articles in the materia medica, though the Oresthetics are alterative in a way and manner the very antipodes of the Mercurials, which so many consider as the very type of alteratives. In fact I consider all medicines as alteratives, since all, if they do their duty, change condition and action in a greater or less degree; the different classes of medicines however doing it in a widely different manner. I have often been called to the bed-side of patients, in very different diseases, when very judicious prescriptions, as appeared to me, had failed of producing any of their ordinary and desired effects. Without any alteration of the course of medication, but only with the addition of a good Oresthetic, I have often known the other medicines immediately produce all the effects that were expected of them.

In many cases where there has been such an inordinate degree of morbid susceptibility, that the patient could not tolerate a sufficient quantity of any appropriate medicine, to render any material service, I have known the use of Oresthetics to obviate all this morbid susceptibility, so that the patient could take and retain any medicine that was appropriate, in any quantity necessary to obtain its best effects in the case under treatment. In some cases of Cholera too long neglected, in which every thing else would be rejected as soon as swallowed and before there was time for the production of any thing but a mechanical effect, whether given in small, moderate, full or large doses, I have often known a strong and hot infusion of Capsicum not only to be retained, but to sit well, and to arrest the vomiting for the time being, entirely obviating the morbid susceptibility or irritability as respects upward peristaltic action, and when there was no material general exhaustion, contribute as much as any thing else toward the suspension and cure of the disease. In such a case as this just specified, the operation of the Oresthetics seems to be mainly exerted upon the Esophageal and Gastric Par vagum, upon which upward peristaltic action exclusively depends, since in exquisite Cholera there is no retching, or in other words, no associated action of any of the expressory muscles of the thorax with the stomach and Esophagus, and of course no other expressory motor nerve, except the Esophageal and Gastric Par vagum, is at all affected.

A certain amount of the most active Oresthetics would produce a Phlogosis Erythematica, or even an Ulceration in the part to which they are applied. If the part thus affected were the stomach, death might be the consequence. This would be an indirect extinction of life. Many of the Oresthetics are sufficiently intense in their operation and effects, to destroy the life of a part immediately when applied in sufficient quantity. Such an effect produced in the stomach would of course be fatal. This is one way in which they may destroy life. This is probably the most direct way in which they ever extinguish life. Thus it appears that the Oresthetics destroy life by extinguishing the functions of a greater or less portion of the involuntary motor nerve of chymical action, nutrition and reproduction.

This class has been called *Stimulantia*, *Incitantia* and *Excitantia*; not only in the least limited sense of these terms, but also in their most limited one, among authors, viz. as comprising what I call Erethistics, Euphrenics, Oresthetics and Antisbestics. It is quite possible, as I have already said, to make the Oresthetics produce a peculiar sort of Erethism of their own; but this operation is essentially different and distinct from the Erethistic operation of those articles which I call distinctively by the denomination of Erethistics; but I have said enough upon this subject, in the proëm to the class of the proper Erethistics. I will only add that, a part of the effects of an Oresthetic power might perhaps be reckoned as Erethism; but here also, it is an Erethism of a widely different quality from that of a proper Erethistic; and it is by no means admissible to rank a single grade of the effect of one power, with the whole effect of another power.

The pure Oresthetics certainly do not produce a single grade or stage of the operation of the Euphrenics; and therefore I need not waste either time nor words in arguing this matter.

In most of the books of *materia medica*, the Oresthetics, when administered internally, are called Stimulants, though John Murray puts Capsicum (one of the best types of the Oresthetics) into the class Tonics. And yet all the gentlemen with whom I associated during my professional pupillage, and the early part of my professional practice, knew very well that the group of articles which I now call Oresthetics, never increased vital energy and strength of action in any part of the system, which is the essential opera-

tion of a true and proper Stimulant; and they always kept this fact in view, whenever they prescribed any of these agents. An Oresthetic operation has been maintained to be a Stimulant operation exerted upon the mucous membranes or upon the skin; but all there is of a true Stimulant, i. e. an Antisbestic operation consists in a quickly diffused and transient increase of vital energy and strength of action in the Sanguiferous system. Now the Oresthetics never produce any such effects in any subordinate part of the system and certainly not in the heart and blood-vessels. I doubt not that such a definition might be made of Stimulants as would include Antisbестics, Oresthetics, Euphrenics, Erethistics, and any other class of agents that might be chosen. So doubtless might such a definition be made for such a genus in botany (as I have heretofore said by way of illustration) as might include the Peach, the Apple, the Willow, the Elm and the Oak; but what sort of a genus would such a one be? It would be no true genus at all events. I think however, that it would be as good as such a class as I have mentioned.

I have been acquainted with several practitioners of medicine, beside those with whom I associated early, who recognized the most important negative peculiarity of this class, viz. the circumstance that the power on which it is founded never produces any increase of vital energy and strength of action in any subordinate part of the animal economy. Some of these gentlemen have been in the habit of distinguishing the Oresthetics proper by the denomination *Irritantia*. This is better than no distinguishing name, but still it is a very ineligible one, as on the whole, it conveys more or less incorrect notions, and is besides a pure Latin term, contrary to the rule for the names of the classes. Employed as I have just mentioned, the term *Irritantia* has exclusive reference to an Oresthetic effect as produced by an article taken internally. But I have often known the term *Irritantia* applied to that grade of an Epispastic operation, that falls short of Rubefaction; and also to a moderate grade of Rubefaction.

Some authors reckon what I consider a simple and pure Oresthetic power as identical with a Tonic power, since they associate some of the simple and pure Oresthetics with simple and pure Tonics. How these two classes can possibly be considered as founded upon one and the same power, I can not imagine; and

if they are not one and the same, I do not understand how one class can be founded upon two different and distinct powers.

When applied externally, the effects of the Oresthetics are always called Epispastics; but an Epispastic operation is commonly said to be a Stimulant operation. Two classes in the *materia medica*, are then confessedly founded upon one single power. As a public instructor, I was over-ruled by particular friends (*viz.* gentlemen opposed to the employment of any formal classification in this department of medicine, and much more especially opposed to all innovations) to retain Epispastics as a distinct class, in contradistinction from Oresthetics, since it would be such a grave affair to call Epispastics by a new name.*

This I submitted to contrary to my own principles and judgment. Upon this plan, the only differences that I could possibly specify between the two, were the confining of the term Oresthetic to the internal use of these articles, and the reckoning of only the first two grades of operation as medicinal, the other three being considered as morbid; while the term Epispastic was restricted to the external application of this article; and the reckoning of the third and fourth operation as medicinal, the fifth only being considered as morbid.

All the Oresthetics capable of producing any grade of an Epi-

* I never could understand the great horror that seems to be felt by almost every body, at the least change either in views or language, in any of the departments of human knowledge. It really seems as if most people prefer retaining the most absurd errors, and resting under the grossest deficiencies, in almost every department of science, to the admission of any change, or any addition, which is of course stigmatized as innovation. How long will it be before the Clergy will be willing to relinquish the notion and the language resulting from it, that the heart is the seat of the affections and passions? If this particular error (gross and absurd as it is) is to be retained from fear of innovation, why not go back to still older errors, *viz.* that the liver, the kidneys, or even the tendinous portion of the diaphragm exercises these functions. I believe (though perhaps I am mistaken) that I have mentioned these notions in the reverse order of their antiquity. Now the same reasons that prevent the adoption of the truth as ascertained by modern science, would be altogether in favor of retaining the very oldest of these hypotheses, in preference to any later one. I have often regretted that the supposed work of Solomon on natural history has not come down to us, that I might ascertain whether these persons, so much afraid of all change, would not insist that it should take the precedence, and be adopted as the sum of all knowledge upon the subject, to the exclusion of the works of Linnæus, De Candolle, Cuvier, etc. I presume that all such persons would reject all modern discoveries in opposition to ancient ignorance, deficiency and error.

spastic operation from Rubefaction at least, to Causis or Escharosis, have been called by the several terms denoting these several grades; and every one of them, as I believe, has been reckoned as a distinct class by some author or other. The names of these several grades (excluding *Antipsorica*) are—1. *Rubefacientia*, *Phænigmi* or *Sinapismi*; 2. *Vesicantia* or *Vesicatoria*; 3. *Ulcerantia*, *Suppurantia*, or *Suppurativa*; 4. *Caustica* or *Escharotica*.

The *Antipsoric* grade of an Epispassic operation (at least as I understand and employ the term) falls short of Rubefaction, but changes action and condition in the skin to a sufficient extent to cure certain cutaneous eruptions, but by no means the whole. I do not know that what I consider the Antipsoric grade of an Epispassic operation, has ever been recognized as belonging to the Epispassics, by any medical writer or practitioner beside myself; but I may possibly be in error on this subject.

The term *Rubefacientia* denotes that grade, which consists in incipient Phlogosis Erythematica, chiefly indicated by crimson redness, soreness and what is commonly called smarting. The ancients applied the term *Phænigmi* to those Epispassic articles which produce naturally and ordinarily the slightest grade of Epispassic operation, except that grade which I call Antipsoric. I believe that the grade denoted by the term *Phænigmi* was a slight grade of Rubefaction, since the Greek verb, from which this term is derived, means to redden. The term *Sinapismi* was employed by the ancients to denote one of the grades of an Epispassic operation, though it is immediately derived from a Greek name for a large shrub or small tree called in natural history *Salvadora Persica* (*Rowb?*) said to be identical with *Cissus arborea* (*Forskæl*) and *Rivina paniculata* (*Linn.*) The vernacular name of this tree in the Scriptures was unfortunately supposed by some of the early translators (who were not at all acquainted with the natural history of Palestine, Arabia, &c.) to mean the plant at the present time called Mustard, and has occasioned that to be named *Sinapis* in natural history. This is not the only similar error. The bark of the root of this plant is very acrid, and was anciently much used for a certain grade of Epispassic operation, and so gave name to it.

The terms *Vesicantia* and *Vesicatoria* denote that grade of

operation in which the cuticle is elevated by an effusion of serum, but without any ulceration of the cutis vera or true skin.

The terms *Ulcerantia* and *Ulcerativa*, or *Suppurantia* or *Suppurativa*, and probably *Erodentia* (though this last term is some times applied to the next grade) denote that grade of operation in which there is not only an elevation of the cuticle but an ulceration of the cutis vera and a secretion of pus between them instead of serum.

The terms *Caustica* and *Escharotica* denote that grade of operation in which the vitality of a small part is destroyed and forms an eschar or slough, after the separation of which, an ulcer remains.

The term *Erodentia* has some times been applied to the ulcerative or ulcerant stage of an Epispastic operation. This term implies a mere chymical action, which is grossly incorrect in application to any true medicinal operation, which is always an operation upon the vitality or vitalities of the animal system.

This class of remedies has then had eighteen names applied to it either as a whole, or to its parts, viz. *Stimulantia*, *Incitantia*, *Excitantia*, *Tonica*, *Epispastica*, *Irritantia*, *Phænigmi*, *Rubefacientia*, *Sinapismi*, *Vesicantia*, *Vesicatoria*, *Ulcerantia*, *Ulcerativa*, *Suppurantia*, *Suppurativa*, *Erodentia*, *Caustica* and *Escharotica*. As I have already said, it has long been a rule established by usage that no mere Latin term should be employed as the name of a class in the materia medica; and yet this rule has always been violated in a few cases, from a supposed deficiency of appropriate and convenient Greek terms. However, no such deficiency really exists, and therefore the rule should be strictly adhered-to; or Latin terms should be used exclusively. This rule would exclude twelve of the terms that I have just mentioned, if they did not merit exclusion on other grounds.

From what has been said, it will be obvious that this class is new in the materia medica, that the name is new, and the definition likewise.

There are well known Oresthetics which possess one or more of the following thirteen powers, either separately or in conjunction, viz. Atnitphlogistic, Neuragic, Narcotic, Erethistic, Euphrenic, Antisbestic, Tonic, Styptic, Adenagic, Diuretic, Diaphoretic, Emetic, and Cathartic. In conformity with my previous usage,

the several articles of this class should be arranged and enumerated in distinct groups according as they possess one or more of these several powers ; but I shall omit this in the class now under consideration, and probably in the rest of the classes which are to follow. The fact that very many perfectly pure Oresthetics, i. e. Oresthetics without any other power in addition, certainly exist, appears to me to furnish a conclusive argument that this power is distinct from every other power recognized in the *materia medica*. It is also a very strong argument in favor of the same conclusion, that an Oresthetic power exists in conjunction with several confessedly different, distinct and some times opposite and incompatible powers.

PROËM TO THE CLASS ANTISBESTICA.

The term Antisbestica is not an ancient Greek term, but is compounded of a Greek preposition, signifying *against; in opposition-to* ; etc. and the regular formed attribute from a Greek verb signifying *to exhaust; to extinguish; to destroy* ; Etymologically then, this term signifies articles that oppose, or counteract exhaustion, extinction or destruction ; etc. The term Antisbesis is composed of the same Greek preposition signifying *against; in opposition-to* ; etc. and a Greek noun-substantive signifying *exhaustion; extinction; destruction* ; etc.

Definition.—Antisbestica or Antisbestics are articles which directly produce a quickly diffused and transient increase of vital energy and strength of action of a peculiar sort, primarily at least, if not mainly, in the sanguiferous system, but probably, in a greater or less degree in all the parts dependent upon the nerve of chymical action, nutrition and reproduction, commonly called the great sympathetic nerve ; thereby obviating or contributing to obviate atony, exhaustion or debility in the parts specified, when it exists.

Notwithstanding this definition, we are not to suppose that the whole of the effects of the Antisbestics, under all modes of management, are transient. It is quite certain that by a continuous and suitably frequent repetition of well adapted doses of the Antisbestics, we get the real permanence of effect which belongs to the Tonics. It is a law of the operation of the Antisbestics (just as it is of the Euphrenics) that a frequent repetition of the production of their effects, gradually renders them more and more protracted and considerable. The truth is that the real cessation of the effect of a dose, does not coincide with the apparent cessation, the former without doubt, being much more protracted than the latter. Now by the mode of administering the doses above specified, there is really a prosthesis of the effects of the several doses, which some how or other (I know not in what manner) causes them to be much more enduring and permanent. On first entering upon the use of the Antisbestics, it frequently appears for a considerable time, as if nothing valuable is likely to be accomplished by them; but when there has been a sufficiently continuous repetition of suitably frequent doses, there begins to be not only a considerable, but also a permanent increase of vital energy and strength of action in the heart and arteries. This is a mere statement of a fact, not an explanation of any thing. The real truth would seem to be that it is only the primary effects of the Antisbestics that are transient. The explanation of the how, why, etc. can no more be given, than in regard to the *modus operandi* of other classes of medicines. The *quo modo* is equally unknown in the case of every other class of medicinal agents.

The power on which this class is founded, has undoubtedly been known for an indefinite time past; but by all authors and practitioners of medicine, that I have any knowledge of, it has always been confounded with three other different and distinct powers, and very often with more. At all events, I can not find that any author has ever founded a class upon this power specifically and distinctively from several others. I think therefore that I may say with certainty that the class, the name and the definition are new. The name has been much caviled-at; but as I trust, it is legitimately formed, and also applied to that, which distinctively has never had a name previously; and therefore I hope I shall be permitted to use my own term in my own way.

tisbestic effect will be perceived. It would seem as if much Ultimate-Narcosis transcended, superseded and was incompatible with Antisbesis. But however it may be explained, the fact has been long known, and often recognized. For example again, some of the Oresthetic-Antisbestica, when given as largely in the twenty-four hours as they can be, without producing Ultimate-Oræsthesis, are decidedly and prominently Antisbestic; but when increased to the extent of producing any material amount of Ultimate-Oræsthesis, there is no Antisbesis, but on the other hand, more or less exhaustion. It would seem here, as if any material amount of Ultimate-Oræsthesis transcended, superseded and was incompatible with Antisbesis.

Were there any articles possessing both Antisbestic and Cathartic powers in conjunction (I know of no such, though I esteem it quite a possible combination) we should doubtless be able to obtain Antisbestic effects, when as large an amount was taken as could well be, without Catharsis; but active Catharsis would doubtless transcend, supersede and be incompatible with Antisbesis.

Many operations and effects are commonly considered as produced by an Antisbestic power, because they are occasioned by articles always called Stimulants; though they are in fact the operations and effects of different and distinct powers, not at all recognized as belonging to the articles in question. For example, with very many persons both medical and non-medical, intoxication or inebriation is considered as pure Stimulation. I have often inquired of those entertaining this notion, as to the sense in which they supposed that intoxication or inebriation is Stimulation, and I always found that it was the sense of Antisbesis so far as any definite idea was attached to this term. Now I insist that Antisbesis is no part of this state or condition, and does not in the least enter into its composition; and yet so prevalent is the view that I am combating, that it has got to be almost universal language to say of a drunken man, that he is Stimulated. Can it be possible for physicians entertaining such loose and incorrect notions in regard to the powers and operations of the *materia medica*, to prescribe remedies for disease, with any great degree of discrimination?

An Antisbestic operation, so far as its mere definition is con-

Usually Antisbestics indirectly diminish atonic morbid frequency of the pulse; but, in perfect health, they commonly, though not invariably, increase the frequency a few beats. They also diminish, in a moderate degree, both morbid irritability and irritation and irritative actions generally; morbid sensibility and sensation; morbid mobility, restlessness, jactitation, and preternatural watchfulness; but they appear to accomplish this in an indirect manner, and by virtue of obviating the conditions upon which these symptoms depend, or with which at least they are inseparably connected; and they accomplish this, in a less degree than the Euphrenics, and of course, in a still less degree than the different Narcotics.

Pure Antisbestics never produce the least trace of the last three stages or degrees of a Euphrenic operation; nor a single symptom of what constitutes true Narcosis in any degree, with the occasional exception of nausea and vomiting, and some times headache, from the mere irritation of excessive doses, or excessive quantities in the twenty-four hours; nor do they produce any condition at all analogous to that prostration which some times succeeds a single excessive dose of certain Narcotics. I make these express statements to show the incorrectness of the opinion of many, that the articles which I call Antisbestics are identical with the Narcotics, the Antisbestic or Narcotic operation predominating according to the doses, the periods of repetition, and the amount taken in the twenty-four hours; or in one phrase, the method of management.

It may seem singular to some that there should be articles, which in certain doses and quantities, should produce decided Antisbestic effects, while in considerably larger doses and quantities, they exert no grade or degree of this effect. Such however is certainly the fact with regard to a moderate number of articles at least. For example, the inspissated descending sap of *Papaver somniferum*, when given in uniform doses, at regular and short intervals, in as large a quantity in the twenty-four hours as can be taken without producing any Ultimate-Narcosis, is very obviously Antisbestic, as well as Euphrenic and Erethistic; but if the doses are augmented, the periods of repetition made less frequent, and the quantity taken in the twenty-four hours so much increased as to produce considerable Ultimate-Narcosis, no An-

tisbestic effect will be perceived. It would seem as if much Ultimate-Narcosis transcended, superseded and was incompatible with Antisbestis. But however it may be explained, the fact has been long known, and often recognized. For example again, some of the Oresthetic-Antisbestics, when given as largely in the twenty-four hours as they can be, without producing Ultimate-Oresthesis, are decidedly and prominently Antisbestic; but when increased to the extent of producing any material amount of Ultimate-Oresthesis, there is no Antisbestis, but on the other hand, more or less exhaustion. It would seem here, as if any material amount of Ultimate-Oresthesis transcended, superseded and was incompatible with Antisbestis.

Were there any articles possessing both Antisbestic and Cathartic powers in conjunction (I know of no such, though I esteem it quite a possible combination) we should doubtless be able to obtain Antisbestic effects, when as large an amount was taken as could well be, without Catharsis; but active Catharsis would doubtless transcend, supersede and be incompatible with Antisbestis.

Many operations and effects are commonly considered as produced by an Antisbestic power, because they are occasioned by articles always called Stimulants; though they are in fact the operations and effects of different and distinct powers, not at all recognized as belonging to the articles in question. For example, with very many persons both medical and non-medical, intoxication or inebriation is considered as pure Stimulation. I have often inquired of those entertaining this notion, as to the sense in which they supposed that intoxication or inebriation is Stimulation, and I always found that it was the sense of Antisbestis so far as any definite idea was attached to this term. Now I insist that Antisbestis is no part of this state or condition, and does not in the least enter into its composition; and yet so prevalent is the view that I am combating, that it has got to be almost universal language to say of a drunken man, that he is Stimulated. Can it be possible for physicians entertaining such loose and incorrect notions in regard to the powers and operations of the *materia medica*, to prescribe remedies for disease, with any great degree of discrimination?

An Antisbestic operation, so far as its mere definition is con-

Usually Antisbestics indirectly diminish atonic morbid frequency of the pulse; but, in perfect health, they commonly, though not invariably, increase the frequency a few beats. They also diminish, in a moderate degree, both morbid irritability and irritation and irritative actions generally; morbid sensibility and sensation; morbid mobility, restlessness, jactitation, and preternatural watchfulness; but they appear to accomplish this in an indirect manner, and by virtue of obviating the conditions upon which these symptoms depend, or with which at least they are inseparably connected; and they accomplish this, in a less degree than the Euphrenics, and of course, in a still less degree than the different Narcotics.

Pure Antisbestics never produce the least trace of the last three stages or degrees of a Euphrenic operation; nor a single symptom of what constitutes true Narcosis in any degree, with the occasional exception of nausea and vomiting, and some times headache, from the mere irritation of excessive doses, or excessive quantities in the twenty-four hours; nor do they produce any condition at all analogous to that prostration which some times succeeds a single excessive dose of certain Narcotics. I make these express statements to show the incorrectness of the opinion of many, that the articles which I call Antisbestics are identical with the Narcotics, the Antisbestic or Narcotic operation predominating according to the doses, the periods of repetition, and the amount taken in the twenty-four hours; or in one phrase, the method of management.

It may seem singular to some that there should be articles, which in certain doses and quantities, should produce decided Antisbestic effects, while in considerably larger doses and quantities, they exert no grade or degree of this effect. Such however is certainly the fact with regard to a moderate number of articles at least. For example, the inspissated descending sap of *Papaver somniferum*, when given in uniform doses, at regular and short intervals, in as large a quantity in the twenty-four hours as can be taken without producing any Ultimate-Narcosis, is very obviously Antisbestic, as well as Euphrenic and Erethistic; but if the doses are augmented, the periods of repetition made less frequent, and the quantity taken in the twenty-four hours so much increased as to produce considerable Ultimate-Narcosis, no An-

tisbestic effect will be perceived. It would seem as if much Ultimate-Narcosis transcended, superseded and was incompatible with Antisbestis. But however it may be explained, the fact has been long known, and often recognized. For example again, some of the Oresthetic-Antisbestics, when given as largely in the twenty-four hours as they can be, without producing Ultimate-Oræsthesis, are decidedly and prominently Antisbestic; but when increased to the extent of producing any material amount of Ultimate-Oræsthesis, there is no Antisbestis, but on the other hand, more or less exhaustion. It would seem here, as if any material amount of Ultimate-Oræsthesis transcended, superseded and was incompatible with Antisbestis.

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An Antisbestic operation, so far as its mere definition is con-

cerned, would seem to differ from a Tonic operation only in the greater rapidity and diffusibility of the former, and the greater slowness and permanency of the latter; and yet a careful observation of the two, as I think, will soon show that there is a difference in the quality of the two effects, which is exceedingly difficult, if not impossible to define satisfactorily, if not even intelligibly. Without opportunity of observing the trial, it might perhaps be supposed that the operation of uniform doses of the Antisbestics at regular and short intervals, would be much, if not identically, the same as the effects of the Tonics given at considerably longer intervals; but such is by no means the fact. The Tonics are not capable of answering much purpose, as substitutes for the Antisbestics, i. e. when the Antisbestics are the most highly indicated and of the greatest importance. Indeed, in many such cases, they will absolutely do nothing, and their use may as well be intirely omitted. In the extreme exhaustion that sometimes takes place suddenly at the beginning of certain malignant acute diseases, I never could perceive that the most active of the mere Tonics ever rendered the least service. From witnessing frequent trials of them in such cases, I came to the conclusion long ago, that they are better omitted than employed. Under such circumstances, I have long been satisfied that they are not only in the way, but that they do more or less positive injury.

The converse of this is not however equally true. Antisbestics in uniform doses, at regular and short intervals, are quite a tolerable substitute for Tonics. There are in fact some cases, in which Tonics would seem to be the appropriate remedies, but in which there is too much exhaustion for them to accomplish any thing, till Antisbestics have been used for some time, by way of preparation for the Tonics. It is not the fact therefore, that these two classes are, under any circumstances, integral substitutes for each other.

Nothing then, but the quick and rapid augmentation of the vital energy and the strength of the action of the sanguiferous system can ever be taken as the test of Antisbestis, i. e. the effects of the Antisbestics. The obviation of languor and lassitude, the production of a peculiar calm, placid and pleasant sensation, the occurrence of a peculiar preternatural but rather agreeable wakefulness, and the existence of a greater or less degree of positive

laration, are no test of Antisbestis, because either one or all of the effects may be produced in an eminent degree, when the vital powers of the circulating system are in a state of great exhaustion, and still rapidly waning. Increased exertion of voluntary muscular power is no test of Antisbestis, since this may exist in a high degree, when the extremities are cold and pulseless, and entirely disappear when warmth and pulsation are perfectly restored. Increased animal heat can be no test of Antisbestis, because the highest possible degree of it is not incompatible with an extreme degree of exhaustion of all the vital powers, as in the atonic cases of hot Typhus i. e. Typhus putridus. The production of topical irritation, Rubefaction or Erythematic Phlogosis by acrimony or an acrid principle, does not indicate Antisbestis, because numerous articles will produce these very effects, at the very same time that they are decidedly exhausting, as for example, Nitrate of Potassa, and Tartrate of Antimony and Potassa. Increased frequency of pulse, whether in a moderate or considerable degree, is no test of Antisbestis (contrary to what many suppose) since all exhausting measures produce this effect and since I have known the frequency of the pulse increase to two hundred by profuse Hemorrhage. All of these, I have already mentioned as the tests of that sort of Stimulation which is considered as opposed to exhaustion and which of course, means Antisbestis.

I have known many physicians who believed that all medicines were either Antiphlogistic or Stimulant. All of these gentlemen, to whom I ever had opportunity to converse, seemed to have more definite ideas of an Antiphlogistic than of a Stimulant. With respects to the former, they attached much the same meaning to the term that I do, only their notions were more vague and loose.

As respects the latter, they seemed to consider every thing falling under that denomination, which is not positively Antiphlogistic. In correspondence with this, these gentlemen considered all diseases as either entonic or atonic, or as the language of that period was, sthenic or asthenic. I believe that very many members of the medical profession, soon after the time of John Brown, entertained these opinions. At this time it is not necessary to combat these notions, since (so far as I have means of judging) much the greatest part of the *materia medica* would now

be generally admitted to be neither Antiphlogistic nor Stimulant.

There was a time when experiments were made, in our country at least, by administering a certain number of doses of a given article in a day, and examining the pulse from time to time. If its frequency was found to be increased while the subject was taking the medicine, it was of course Stimulant. If the frequency of the pulse was not increased at any time, but on the contrary happened to be diminished, the article was of course Antiphlogistic. Evacuant powers were almost the only powers that were considered as different and distinct; and even Emetics were said to vomit in consequence of Stimulating the stomach; and Cathartics were said to purge in consequence of Stimulating the intestines. This same mode of explanation was likewise adopted in reference to Diuretics, Diaphoretics, Emmenagogues so called, and Expectorants so called. A few articles were said to be chymical remedies, and a few mechanical remedies. All the rest were either local or general Stimulants or Antiphlogistics. By some, even the last were reckoned as chymical remedies.

The number of true and proper Antiphlogistics that are now in common use, is certainly not large, and many of these are not recognized as such, when they are employed, but are given as Stimulants, using this term in the most limited sense, in which it is employed by authors and practitioners, viz. as comprehending the Erethistics, Euphrenics, Oresthetics and Antisbestics. I know many practitioners of medicine who frequently employ Nitrate of Potassa, without any thought that it is at all Antiphlogistic or exhausting in any degree, though this is the only effect that it produces as customarily given and managed. Again, except among my own pupils and friends, I never knew the Chlorite of Potassa prescribed but as a Stimulant, though its only operation, as ordinarily used, is that of a mere Antiphlogistic or highly exhausting agent. I have known a considerable number of physicians, who were in the habit of prescribing Tartrate of Antimonia and Potassa, as a Stimulant and Tonic, when the only effects which it produced in their practice, were Antiphlogistication or Exhaustion, Nauseation and Sub-Catharsis. I have been in the habit of seeing Acids, both those of vegetable-organic, and those of chymical origin, prescribed in very atonic diseases, some times as Stimu-

lants, some times as Tonics and some times as Antiseptics, when their only effect, as used, was Antiphlogistic or exhausting.

But I have been in habits of intercourse with medical gentlemen who considered the several *Ætheres* as among the most powerful Stimulants in the *materia medica*, and who prescribed them accordingly, though all the effects that I could ever perceive from them, as they were used, were Antiphlogistic and exhausting effects. The Hyponitrite of Protoxyd of Etherogen or true Sweet Spirit of Niter (not what is very often sold for that article) I have seen prescribed as a Stimulant much the most frequently; and I never knew it fail of operating as an Antiphlogistic or exhausting agent; but it is the feeblest exhausting agent of all the *Ætheres* whose operation I have had opportunity to observe. Before I ever knew this article used as a Stimulant I had often seen it used as an Antiphlogistic in genuine Phlogistic diseases, immediately after depletion of blood and had uniformly known it answer well, as a mild Antiphlogistic. I had previously been instructed that truly Phlogistic diseases would not tolerate Stimulants even after depletion of blood, so that I was surprised to find any body reckon an article as a Stimulant, which was decidedly useful in Phlogistic diseases. I have not infrequently known Protoxyd of Etherogen tried in uniform doses, at regular and short intervals, as a Stimulant in Typhus in which there was considerable exhaustion; but I never knew a physician who did not cease to employ it in this way after a few trials. I have several times inquired the reason why such practice was abandoned, and always got for answer that "it did not answer well." I do not remember that I ever got any body to admit that it was a direct exhausting agent after once entertaining the opinion that it is a Stimulant. Several however have told me that they found it such a powerful Stimulant that it produced indirect debility very speedily. I doubt not that this is about all the foundation that exists for the doctrine of indirect debility. So far as my own personal observations are capable of verifying any thing, I have long been satisfied that Common-*Æther* is a direct exhausting agent.

These specifications and statements I deem necessary to illustrate and explain what I have so often said in regard to the vague, loose and unjustifiable use of the term Stimulant, and to prove the necessity of a new term, as well as a new definition, in place of

one which has never been used with any definiteness and precision, and which has often been employed with greater latitude than any other term in the *materia medica*, or even in medicine generally.

Ever since about the year 1810, Tritochlorid of Formicigen, or Chloroform has been more or less used in some parts of Connecticut, as a Stimulant, under the very definite name of Chloric Æther, there being only seven different and distinct compounds bearing this name. Near the beginning of its use as above mentioned, I made a course of experiments with it, and ascertained it to be an efficient exhausting agent. My experiments have been repeated three or four times by different sets of medical students, and always with the same results. Beside this, I have repeatedly had opportunity to watch its operation, when four doses a day have been taken for a considerable number of weeks. In every instance, it produced exhaustion and nothing else; and in some of the cases a serious and obstinate degree of it; and in one a dangerous degree of it, from which recovery was very difficult. And yet its prescription as a Stimulant is very frequent within my knowledge.

There are many articles possessing considerable acrimony which are therefore reckoned as Stimulants, but which are in reality direct exhausting agents of very considerable power, though they are not Antiphlogistic, on account of other powers which they possess at the same time. From the fact that they are called Stimulants, they are often prescribed where Antisbestics are really indicated, very much to the detriment of the patient.

From the very beginning of my professional career, I have always been in the habit of availing myself of every opportunity of seeing and watching the practice of others, much more particularly when it differed from my own. In this way I consider myself as having had peculiar advantages for acquiring a knowledge of the true *juvantia* and *lædientia* of all common diseases, and of a considerable number of rare ones. To this custom, I am greatly indebted for much of my knowledge in regard to the various articles commonly called Stimulants. Few medical gentlemen seem to appreciate this means of improvement. It is certainly a legitimate means, so long as there are diversities of practice, as in all probability there ever will be, so long as medicine is practiced. As appears to me, no experience on this subject can be

considered as in any degree complete, till it has been brought to the test of comparative trial, and that too under the direction of those who habitually follow each mode of practice as their own, since no man can possibly be expected to carry-out in the best manner a mode to which he has not been accustomed, or one which perhaps he has never tried but once. No practitioner can follow-out with the greatest success, any plan of treatment, for any important disease, which he has not tried with sufficient frequency to give him the necessary tact and dexterity in its adaptation to particular circumstances and cases.

Different individual Antisbestics, though agreeing in every thing that enters into and constitutes the definition, doubtless differ among themselves as respects the peculiar quality of their influence, operation and effects, so that no one of them can be said to be an exact substitute for any other, and much less for all the rest. In this respect however, they only agree with all the other classes of remedial agents. From such a fact, it will be obvious that in prescription, not only the degree or intensity, but also the quality of the Antisbestic power should be carefully adapted to the nature and character of the pathological conditions. No intelligent physician can ever imagine that as Antisbestics, Phosphorum elementarium, Cantharis vesicatoria, Rhus venenata and Alcohol officinale, are exact equivalents, or equally well adapted to every individual case in which an Antisbestic may be indicated.

Let it be observed that Antisbestics and Antiphlogistics are the opposites of each other, and not Antisbestics and Sedatives, as seems to be so generally supposed. The abatement of morbid irritability and irritation; of morbid sensibility, morbid sensation and pain; the obviation of restlessness, wakefulness and jactitation, are all sedative effects, which may be made to take place at one and the same time with the most decided Antisbestis. In fact, there are articles in the materia medica which possess both Antisbestic and Sedative powers in conjunction; but there are no articles which possess both Antisbestic and Antiphlogistic powers in conjunction. If any one entertains any doubts in relation to this subject, let him carefully observe the operation and effects of Papaver, Wine and Alcohol, administered in uniform doses, at regular and short intervals, as much being administered in the

course of the twenty-four hours as the subject can tolerate without any degree of Ultimate-Narcosis, under which course, both Antisbestis and Sedative may be witnessed in conjunction and at one and the same time, as well as some other operations. In connexion with this subject, I must be allowed to say that I do not think that the term Sedation is ever correctly applied to the Antiphlogistics, though they powerfully alleviate the morbid irritability and irritation, the morbid sensibility, morbid sensation and pain; the morbid mobility, restlessness, jactitation and wakefulness of the Plogistic, sthenic or entonic diathesis. I do not consider it at all proper to call operations as different as those of depletion of blood, Nitrate of Potassa and Tartrate of Antimonia and Potassa on the one hand; and Papaver, Wine and Alcohol on the other, by the same name. In this sense of the term Sedative (if it should be allowed) we might indeed say that Antisbestics and Sedatives are opposed to, and incompatible with each other.

In one point perhaps, Antisbestics and Narcotic-Sedative powers may be considered as opposed to each other. All the Antisbestics with which I am acquainted are decided Aphrodisiacs, while Papaver, notwithstanding its moderate Antisbestic power is decidedly Antaphrodisiac; and so are some other Narcotics. I am aware that a different and contradictory statement has been made in regard to Papaver, but in the early part of my professional life my attention happened to be called to this point, and forever afterwards, when ever I had occasion to administer this article freely and continuously to men, I have invariably found it decidedly Antaphrodisiac; in some cases to such a degree as to produce perfect Impotence for the time being. Delicacy has always forbidden my inquiries of women, in relation to this point. Conium maculatum a Narcotic, but not a very active one, at least in its ordinary pharmaceutic forms, as well as Papaver, has been said to be Aphrodisiac, and I am inclined to think correctly; but as I believe this constitutes no exception to what I have just said of Narcotics, since it is in doses and quantities that fall short of the production of Narcosis, that it produces its Aphrodisiac effect, and as I believe by a power different and distinct from that of a Narcotic. It is proper to add in this place that though Antisbestics as such, are always Aphrodisiacs, yet extreme exhaustion is by no means incompatible with Lagnesis Salacitas, or even

Lagnesis Furor. I never yet saw a case of Delirium tremens, in which there was not a greater or less degree of the former; and I have seen the latter, when a fatal degree of exhaustion existed.

Ever since the time of John Brown, it seems to have been very generally believed by physicians, that the regular operation of what are called Stimulants is necessarily and therefore always productive of exhaustion in a greater or less degree. This belief is entertained as much in reference to that operation which I call Antisbestic, as in reference to any other operation to which the term Stimulant has ever been applied. It seems to be believed on the one hand that Stimulants so called never increase vital power or energy in any part, but only force what exists to accomplish more in a given time than is natural, and so expend it the more rapidly. On the other hand, they seem to think that a factitious increase of strength of action in any part of the system must necessarily be followed by a proportional diminution of strength of action as certainly as causing a pendulum to vibrate preternaturally to one side, occasions an equally preternatural vibration to the other side, on its being left to itself.

Stimulants are constantly compared to the use of the whip and the spur upon the horse, being supposed to create no new power, but only to force into greater exertion, and consequently to exhaust more rapidly that which previously existed. If this were true of Antisbestics, I know of no case in which their use would be proper, or even admissible. If these views are correct, Antisbestics can not be of service when there is true exhaustion, and much less when such exhaustion is extreme; since it can not possibly be desirable to force what power actually exists into greater exertion and thereby to exhaust it the more speedily. Assuredly Antisbestics are never indicated when there is no degree of exhaustion.

Suppose a physician reaches the bed-side of a patient at such a period after the attack of a malignant acute disease, that the skin is as cold as the marble table in his apartment, that there is no pulsation in the extremities, that he is in a Coma so profound that he cannot be aroused from it sufficiently to understand any thing said to him, but can only be made to swallow occasionally, after irritating his fauces with the handle of a spoon, or perhaps the feather of a quill that has been dipped into the Water of Ammid

of Hydrogen, etc. Suppose that in consequence of a violent, more or less protracted, and for the time being neglected attack of Cholera, a patient should be reduced to such a state of exhaustion, as to have a skin as cold as a corpse; to be destitute of all arterial pulsation in the extremities; to have a sunken and Hippocratic countenance; to reject constantly every thing to the amount of a tea-spoonful; that he is unable to raise himself or to be raised upright in bed without immediate faintness, etc. Would not and do not most subjects, that have been reduced to such a state actually die without some efficient medicine? In such circumstances there is assuredly great exhaustion of all the vital energies, and the indication is strong to restore them, and by any means in our power. Now what is to be done in such a case? What do physicians administer in such cases? Is it proper under such circumstances to employ Antisbestics or not? Can a patient in such a state ever be restored by their use? Do they in such a case exhaust still further? Is it not well ascertained and generally known that Papaver and Alcohol in conjunction, if managed in the most appropriate and the best manner and employed before the patient is too far exhausted to permit recovery, will actually save many such cases? How is it possible, in the face of such a fact, to persist in asserting that Antisbestics do not augment the vital powers, but only act upon such as exist, exhausting them still further?

Again suppose a case of severe and dangerous non-malignant Typhus nervosus is intirely neglected, or perhaps injudiciously reduced to a still greater degree, by moderate but daily repeated Antiphlogistication, till the fourteenth day, at which time the patient sinks into the very article of death, becoming cold, destitute of arterial pulsation in the extremities, comatose, otherwise senseless, etc. Independent of medical treatment, do not subjects reduced to such a situation almost invariably die? Will not Papaver, Alcohol, Cantharis and other Antisbestics, judiciously managed, save very many of these cases? I perfectly well know that such a course efficiently employed and sufficiently persevered-in, will save the majority. Will any other class or classes of remedies do this? I have no knowledge of a single such case ever being saved by any other means.

Again, suppose that on the access of certain malignant fevers,

as for example, certain species of the genus Typhus, as Typhus syn-
copalis for example, the patient is instantly struck-down, cold,
pulseless, comatose, incapable of being at all roused by being shaken
or spoken-to, incapable of being made to swallow except by thrust-
ing a feather dipped in Water of Ammid of Hydrogen into the
nostrils and irritating the fauces with the handle of a spoon, etc.
Now I have witnessed a considerable number of such cases, and
I have seen many of them restored by a physician's staying per-
severingly by the bed-side and plying them, as often as every
five or ten minutes with Alcohol mainly, but also with other An-
tisbestics, and likewise with Papaver. In some such cases I have
seen Tincture of Papaver prove a very efficient Antisbestic in do-
ses of a fluidrachm repeated every half hour, thoroughly restor-
ing the patient. In one case that I recollect, the last mentioned
agent was continued for three periods of twenty-four hours in these
doses, and with this frequency. At the end of the first twenty-
four hours, it was abstracted, but in six hours without it, the pa-
tient gradually relapsed into the state in which he was found
at first. The medicine was resumed, with the same effect as at
first, and continued another twenty-four hours. Then it was again
suspended, when in about twenty-four hours, the patient again
sunk into a coma, was cold, and nearly pulseless. The pa-
tient was again put upon it, as at first, and was again relieved.
After another twenty-four hours the doses were first gradually di-
minished, and then the intervals between them gradually length-
ened (as ought to have been done at first) on which plan there
was no relapse. Exactly this practice was employed many times,
in similar extreme cases, and always with success. The Narcotic
operation of the Papaver was not perceived at all in these instan-
ces. The beneficial effects seemed to result intirely from the An-
tisbestic and Euphrenic operation. Perhaps there was some Ere-
thistic operation, but if so, it could not well be distinguished. Dr.
Good records a case of Epidemic Cholera treated successfully in
this manner, by mistake; but the same practice was not employ-
ed again in any similar case. Do these Antisbestics, in such cir-
cumstances, act only on the little vital power that remains, and
exhaust still further? No man of common sense, in view of such
a case, can rationally support such an opinion. For myself I
know of no remedies that promise any thing under such circum-

stances except Antisbestics. Without their aid, I never saw such a case saved ; but under their use, a majority of all the cases of the sort, that I have ever known, have recovered.

There are malignant acute febrile diseases, that occur as Epidemics, which from their very outset, are attended with great deficiency of vital energy and strength of action in the sanguiferous system, often with such a degree of it, that without medical aid many patients will die in the course of the first twenty-four hours from the attack. Can any thing be done for such case? Can the exhaustion be obviated in any instances, and cases be saved, which, independent of medical aid would terminate fatally! I suppose that in the instances first specified, the exhaustion extends in a greater or less degree, to all the parts dependent upon the nerve of chymical action, nutrition and reproduction; but as it is not easy to measure strength of action in any of them, except the circulating system, I do not often mention them in connexion with that subordinate part. The false principle which I have often heard maintained and defended, that the use of what are called Stimulants, is productive of only apparent benefit, but is never of any real service, but on the contrary, occasions more or less mischief, concealed for some time, but at last manifest in some irremediable form, has been so long talked-of by physicians, and inculcated upon medical students, that a vague general prejudice exists against them. This we find in the books written for the parlour table of the ladies, and in works of fiction from the highest to the lowest in point of character. Thus for example, Sir Walter Scott says "Cordials otherwise dangerous to the constitution, are given to support a patient through a paroxysm of agony, and to enable him at least to endure what they can not cure." (*Castle Dangerous Edit. Philad. 1832, Vol. I, Pg. 131.*) The diffusion of these notions in such works serves to perpetuate the error, and occasions great mischief; but the number of persons not belonging to the medical profession, who do not appear to think that they understand medicine as well as the members of the profession, is much smaller than would probably be supposed by one who has bestowed no thought upon the subject.

Now there is nothing any more dangerous to the constitution in this class of remedies than in every other class. I know of no disease which is ever produced by an Antisbestic power, nor is

it capable of destroying life, as I have already said, at least so far as I know. In addition to this, Antisbestics are as often radically curative remedies, as any other class in the *materia medica*. I have often had my patients object to taking Antisbestics on the ground that they never render any real service, but only disguise and conceal a patient's true condition, not only from himself, but from his bystanding friends. I have the best reasons for believing that in the course of my professional life, I have witnessed death in a considerable number of truly curable cases, in consequence of the subject's prejudice against, and refusal to take, any thing called Stimulant. Since the commencement of this work, a case of malignant and gangrenous Furuncle has been under my charge, when I was obliged to assure the patient that he would certainly die, if he did not follow my prescriptions (which would unquestionably have happened) but that I thought he might be saved if he would follow my advice. With these assurances he submitted rather imperfectly to my treatment, and recovered, though his case was attended with much hazard.

It is certainly no good argument against the use of Antisbestics, that some medical gentlemen who have even attained to a high reputation are wholly unacquainted with their true powers, operations and effects, and at the same time, have such strong prejudices against them, that they greatly prefer suffering a patient to die of a curable disease, to saving him by such means. I have very certainly known such physicians; and I have known others equally unacquainted with this class of remedies, merely because they never received any instructions respecting them, nor saw them employed during their professional pupillage, nor had read any books afterwards, that directed any treatment for acute diseases, except Antiphlogistics and exhausting agents, or any other invigorants in chronic diseases beside Tonics. I was once acquainted with a physician who had then been in the practice of medicine more than thirty years, but who had never prescribed the amount of half a dozen grains of Opium (its active principles were then unknown) during his whole professional life. This gentleman had no sort of notion of any other powers of Opium except its Anodyne and Soporific ones, though he considered it as highly exhausting. On my inquiry what he was in the habit of employing as an Anodyne instead of Opium, he replied, Tartrate of An-

timonia and Potassa. To the inquiry what he employed in preternatural wakefulness or sleeplessness, he said he did not consider that as a condition for which medicines were required. As to the disease commonly called Delirium tremens his main remedy for it was Tartrate of Antimonia and Potassa. This gentleman spoke of acquaintance, associates and friends, who entertained the same views and employed the same practice with himself.

Now it is true that for the most ordinary purposes of Antisbestics, and when Narcotics are not indicated at the same time, Papaver is of little importance as an Antisbestic; but when a large quantity of this article is indicated and employed, it becomes an efficient Antisbestic. Such opinions as those now under consideration can not but be most thoroughly eradicated by a few years' practice in truly and exquisitely malignant and rapidly sinking febrile diseases, more especially of the nervous type. Let a practitioner of medicine have charge of a few hundred cases of genuine Typhus Syncopalis for example, as it occurred in the Counties of Hartford and Middlesex (Connecticut) between the years 1806 and 1826, or even malignant nervous Remittent, as it occurred in some parts of Vermont in the year 1828, and it will effectually remove all his prejudices respecting the use of Antisbestics in medicine.

I can not entertain the least doubt that the notion that a regular and continuous use of Stimulants (as the term employed is) inevitably produces a greater or less degree of exhaustion (reckoned and called indirect debility, because it has been supposed to result from Stimulation) first originated from the use of real and true Antiphlogistics, that possessed Oresthetic or Euphrenic powers, or both in addition; or from the observation of the effects of the habitual and intemperate use of Wine and Alcohol, both of which possess several other powers in addition, and which produce morbid effects not occasioned by any other articles in the materia medica, and certainly not produced by any other Antisbestics. I have likewise heard the languor, lassitude, head-ache, and nausea and faintness on motion or exertion, which is produced in the morning when a single and too large dose of Papaver has been taken over night, and as I suppose, the analogous effects of Wine and Alcohol also taken in too large a quantity over night, all called indirect debility; though they are no such thing, but

only prostration. True debility will not pass-off in a few hours. I should think that all, or almost all of Brown's notions respecting what he called Stimulants must have been derived from the observation of the operation and effects of Alcohol, Wine and Opium. For myself, I never yet saw any state or condition that answered to Brown's definition of indirect debility; and therefore, I have long since ceased to believe that such a one exists. If any man can demonstrate it, I shall be very glad to revise and change my opinion. Brown's writings undoubtedly rendered service in their day, by stirring up medical intellect, and destroying reverence for effete dogmata in medicine; but I am, not acquainted with a single opinion which he originated, and which was his peculiarly and solely when it was first advanced, that has withstood the test of time and progress, and which can now be shown to be true. In all ordinarily appropriate doses, at suitable periods of repetition, and continued for the length of time that most acute diseases endure. Antisbestics are never followed, either by temporary prostration, or any real exhaustion.

It is a common opinion of many practitioners of medicine, and of some authors, that an excessive and inordinate quantity of an Antisbestic is actually capable of producing a true Phlogistic diathesis. Nothing can be farther from the truth than this. I have even heard this opinion maintained by those who believed that an excessive and inordinate quantity of an Antisbestic would produce indirect debility. This did not seem to be viewed as in any degree a contradiction.

We are perpetually cautioned by authors (and their words are often in the mouths of their readers and disciples) that great care must be exercised to avoid mistaking a Phlogistic or entonic disease for an atonic one; and that we must be particularly cautious to avoid giving Stimulants (so called) where Antiphlogistics ought to be employed "*Caveamus enim ne calcaribus, utamur cum opus sit fræno,*" is a maxim continually quoted, as if the whole danger lay intirely on this side. But cautions against mistaking an atonic disease for an entonic or Phlogistic one, are more scarce than angels' visits, which are commonly said to be few and far between, for I never met with one in my whole professional life. On the contrary, we are expressly told that this latter mistake is far preferable, and indeed of very little importance. Now I do

not take this view of the subject. As appears to me, there is far more danger of the latter mistake, than of the former. The diagnostic symptoms of an entonic or Phlogistic disease are so prominent and unequivocal, that I can not well understand how one can possibly be mistaken for an atonic disease; and suppose that such should be the fact, and the treatment should be in conformity, would not the error be immediately manifest, by the regular and steady aggravation of all the symptoms; and might it not be immediately remedied by a resort to Depletion of Blood, of which the gentlemen that give us these wise cautions, now under consideration, are never afraid, even in atonic, and much less, in non-entonic and non-phlogistic diseases? But suppose that the error is the other way, and an atonic disease is mistaken for an entonic or Phlogistic one; and suppose that the patient is bled between one and two pints (the fashionable range with some practitioners) and suppose the active Saline and Antiphlogistic Cathartics are employed; both of which measures are proper at the outset of a truly entonic or Phlogistic disease; suppose these measures are repeated, or at least a general non-evacuant Antiphlogistic course is pursued up to one of the semicritical periods; when lo! there has been a mistake as respects the diathesis of the case; and then how is the mistake to be retrieved; how is the abstracted blood to be got-back into the blood-vessels; and the exhausting effects of the Antiphlogistic Catharsis and the non-evacuant Antiphlogistication to be remedied? Would not such a mistake decide any but a very trifling case fatally; and would it not render even a trifling case dangerous? I have no doubt that it would. I have witnessed this mistake a considerable number of times, with what consequences it is not necessary to mention here. In addition to this, established practitioners have repeatedly acknowledged to me that they had made it many times at the beginning of their practice; and they ascribed it wholly to the injudicious cautions so often given on the wrong side. That it is often made, where it is not acknowledged to any body, and oftener still, when it is not known even by the person who makes it, can not reasonably be doubted. If I were to be obliged to have a physician that would be likely to make one or the other of these mistakes, commend me to him that will be least likely to mistake an atonic disease for an entonic one. In truth, I never knew a Phlogistic or entonic disease

mistaken for an atonic one ; nor do I think that such a mistake is at all likely to occur. I never conferred with a physician upon this subject who could say that he ever knew it ; but the contrary mistake has been very often observed. In an equivocal case when it is doubtful whether there is entony or Phlogistic diathesis, it can not be very important how the point should be decided. In most such cases, it is almost always the real fact that there is neither entony nor atony. At all events, I never met with the physician who supposed that he had ever done a particle of injury to a Phlogistic case by the mistaken employment of Stimulants. In the catalogue of human diseases, the atonic are very far more numerous than the entonic ; and there are certain periods of time of long duration, in which none of an entonic character occur at all ; though there are never any periods of time, in which no atonic diseases occur. The inference from these facts is obvious.

"Excess of Stimulus or Stimulation," is very often mentioned, not only by physicians, but, after them, by non-medical persons ; and a kind of horror is felt, in regard to this supposed operation. If by Stimulus or Stimulation, is intended a quickly diffused and transient increase of vital energy and strength of action in the heart and arteries, I can only say that I never saw an excess of it, produced by any medicinal agent, during my whole professional life. Nor am I acquainted with many medicinal agents, that could by any means be made to produce "excess of Stimulus or Stimulation," in any case of disease in which such articles are really and truly indicated. Wine and Alcohol are the only two articles, with which I am practically acquainted, that would seem to be at all capable of producing "excess of Stimulus or Stimulation," in any case in which they are really and truly indicated. But the effects of an excessive quantity of Wine or Alcohol are not "excess of Stimulus or Stimulation" but Intoxication—a widely different condition—one which transcends and supersedes a quickly diffused and transient increase of vital energy and strength of action in the heart and the arteries.

As appears to me, the difficulty of producing "excess of Stimulus or Stimulation," in any disease in which such agents are really and truly indicated, is as great, on account of the nature

and character of the diseases, as on any other score. I have great doubt whether Wine or even Alcohol is capable of producing "excess of Stimulus or Stimulation," in exquisitely atonic diseases, or in other words, in diseases of great exhaustion of the vital energies of the circulating system. With all the Wine or Alcohol that could possibly be taken by the patient, I have very often indeed failed of producing as great an increase of vital energy and strength of action in the heart and arteries, as I desired; and in many cases in which I have been satisfied with the amount produced, the attendants have by mistake doubled the quantity of Wine or Alcohol, which I had directed, and so administered it, for the period of twenty-four hours, but without any additional increase of effect. The above opinion is founded on the intrinsic nature and character of an atonic disease. I have heretofore stated my disbelief of the possibility of "excess of Stimulus or of Stimulation, founded on the powers and operations of Wine and Alcohol.

As appears to me "excess of Stimulus or Stimulation," would amount to an entonic or Phlogistic diathesis for the time being, temporary and transient indeed, but still an entonic or Phlogistic diathesis; but as a matter of fact, I do not think that such a condition can possibly be produced, in a disease not naturally entonic or Phlogistic, and much less in a disease naturally atonic. I do not think that it is physically possible to produce an entonic or Phlogistic diathesis, in a disease naturally and essentially atonic. For example, an entonic or Phlogistic diathesis appears to me to be absolutely incompatible with Intermittent, Typhus, Pneumonitis Typhodes, etc. and as I think, the induction of this pathological condition, if it were practicable, would occasion a perfect and complete resolution and obviation of these diseases. But if Wine and Alcohol are incapable of producing "excess of Stimulus or Stimulation," or what I should consider to be the same thing, viz. Entonic or Phlogistic diathesis for the time being, in any disease naturally and essentially atonic, are these agents capable of being given to such an extent in any atonic disease as to disagree in any way, except by the production of inebriation, which is no part of Stimulation in the sense of Antisbestis, and when it is intense, transcends this effect.

I have very often indeed been unable to produce the desired

amount of Antisbestis ; and this has always been the fact in all the cases in which I have seen the largest quantities of Wine and Alcohol employed. In truth these cases have always seemed to be equally incapable both of too much Antisbestis and of Intoxication. The capacity of the stomach to contain without oppression, seems to be the only limit to the quantity that may be used in the above description of cases. In some of the worst instances of *Ohphiodegma venenatum*, or the constitutional disease occasioned by the bite of a venomous reptile, as of *Uropsophus durissus* or *Rattle-Snake*, for example, some one of our medical periodicals several years ago, contained the report of a case some where at the South, in which eight pints of Whiskey were given during the first twenty-four hours, not only without the least symptom of Intoxication, but also without the least "excess of Stimulus or Stimulation." If I do not very much misremember, a Philadelphia Journal, many years ago, contained the statement of some cases of *Pneumonitis Typhodes-nostha*, in one of which, and I think more, the same quantity of Whiskey was given at least in one period of twenty-four hours, by an intelligent and distinguished physician of Virginia, not only without any ill effects, but with the most satisfactory operation upon the disease. I wish that the proof or strength of this Whiskey had been specified. At all events, I never knew more than a quarter as much given in twenty-four hours ; though the largest quantity that I ever saw taken, has repeatedly failed of producing any appreciable operative effects, so that I can not say that if more had been administered, it might not have saved the patient. Far be it therefore from me to disparage the judgment of the physician at the bed-side of his patient, by saying that the quantity taken was too much.

Whenever, in any acute atonic disease, there is great restlessness and jactitation, more especially when accompanied with a cool, moist skin, Oresthetics and Antisbestics, such as Capsicum, Alcohol, etc. are always highly indicated ; and often if not generally Papaver also. When there is considerable preternatural frequency of the pulse, connected with an atonic disease, Antisbestics properly managed, generally diminish this frequency to a greater or less extent ; but they are always incapable of reducing it below the natural and healthy standard. When there is considerable preternatural frequency of the pulse (beyond that of

Phlogistic diathesis) in acute febrile disease, it may be considered as constituting an indication for the employment of Antisbestics. When a patient in Typhus sleeps hard, and on awaking, seems to be as it were fatigued, he may be considered as certainly requiring Antisbestics, Tonics, and Papaver. These may be increased, with proper management, and within reasonable limits, till the patient sleeps easy, and does not awake fatigued. A patient in Typhus should sleep much, and easy; and if he does not readily do this, he should be made to do it, when it is practicable, by the appropriate agents.

When exhaustion or debility is accompanied with very considerable morbid irritability or morbid sensibility, or both in conjunction, the more active and efficient Antisbestics and Tonics, in ordinary doses and quantities, some times disagree, producing morbid irritation and morbid sensation or both, either in the degree constituting considerable and troublesome uneasiness, or in the degree constituting greater or less pain, or some other symptoms, which equally interfere with the employment of the remedies in question. This is commonly considered as a contra-indication for both Antisbestics and Tonics, even though the exhaustion or debility is obvious and prominent. I have very often seen the difficulty in question obviated by much larger doses and much larger quantities of the most appropriate Antisbestics and Tonics, such doses and quantities as will make a sufficiently strong impression at once, and immediately counteract, overcome, and as it were extinguish the morbid irritability and the morbid sensibility in question. Such doses and such quantities, in general accomplish this purpose, "*tuto, cito ac jucundo*," and without producing either irritation, uneasiness or pain. But there is another method of effecting the same object, which is more convenient, and as appears to me, much preferable. This is by a proper use of the most suitable Narcotics, either by way of preparation for the Antisbestic or Tonic, or in conjunction with both. Of the whole class of Narcotics none is better for this purpose, than some preparation of Papaver.

I have often heard physicians state that they had frequently met with cases of acute febrile disease, in which there was great atony attended with cool, moist skin, slight moist coat upon the tongue, frequent and very weak pulse, and every possible indica-

tion for Antisbestics and Tonics, when, on trial, all Antisbestics and Tonics would intirely fail of producing any of their customary operative effects ; but, instead of them, would occasion great languor and lassitude, slight epigastric sinking, faintness, frequent sighing, etc. Now I never had a case of this sort to treat, but have often been called in consultation, where Antisbestics and Tonics were supposed to operate in this manner. As a counselor, seeing the cases only a few times, I could not form as good a judgment of them, as if I had been the attending physician from the first. The subjects in whom Antisbestics and Tonics fail of producing their proper and regular effects, when they seem to be very clearly indicated, are said always to be those who have an extraordinary susceptibility to the ultimate effects of Papaver, and who can take it only in very small doses, and at very short intervals, with any comfort and advantage. Such subjects are usually very susceptible to the ultimate effects of various other articles, unless administered in the very same manner.

Can the supposed inability of these cases to be benefitted by, or even to tolerate Antisbestics and Tonics, be owing to the fact that they are always persons endowed with much greater susceptibility than is common? I have often found such subjects as capable of being benefitted by Antisbestics and Tonics, when clearly indicated, as any other. The only peculiarity that I have witnessed in such subjects, has been the fact that they required a less amount of Antisbestics and Tonics to produce a given effect, than other subjects. Under my observation, such subjects have always become so much like others, by a continuous use of these agents, for a week or ten days, more or less, as to be able to take them very much like others, and without any peculiarity of operation. Can it be the fact that the peculiarity now under consideration results from any peculiarity in the early treatment? I have often been inclined to think that this might be the fact, since I have never happened to have any such case among any patients that I have attended from the very beginning.

I have often been asked whether Antisbestics will aggravate a Non-entonic or Non-phlogistic, and a Non-atic disease? No such case now occurs to my recollection, in which I have seen them employed, and certainly I have never of myself ascertained either that they will or will not do injury. As Antisbestics are

not at all remedial of such cases, they may perhaps be considered as in the way of other and more appropriate agents ; and upon the principle that "quicquid non adjuvat, obstat," they may possibly be considered as injurious.

I have often heard truly respectable physicians say that though they had often prescribed the articles which I denominate Antisbestics, yet they had never obtained any benefit from them, even in a single case. On particular inquiry, I have always found that these gentlemen had never entered upon their use, till the patient was in what I should consider a hopeless state, in part from the duration and period of the disease, but more especially from the effects of exhausting measures in its early stages. Under such circumstances no treatment is usually of any avail ; but this by no means proves that such cases should never be treated with Antisbestics, or that the patient might not have recovered if the exhausting processes had been omitted, and the Antisbestics had been entered-upon comparatively early. The truth is that it is often quite easy to prevent a patient from falling into a hopeless state of exhaustion, though it is always difficult to recover and raise one, after he has once fallen into this condition. I have very often seen cases of Typhus nervosus for example, in consultation, after what I deemed a fatal sinking. The case had been treated with an active Cathartic at the outset, and subsequently, "the bowels had been kept open," as the statement was. After the Cathartic, Tartrate of Antimonia and Potassa had been employed for a certain time, and then Cephaëlis and Carbonate of Soda had been substituted, till the patient sunk into a desperate state. After this, the officinal powder of Opium and Ipecacuanha, perhaps with the Hyponitrite of Oxyd of Etherogen (Sweet Spirit of Niter) had been entered-upon, till my arrival. The bystanding friends of the patient would then be very solicitous that some thing should be done. Now even in the most hopeless circumstances, there is a right and a wrong, as respects practice ; and in such a case, nothing but Antisbestics can possibly be considered as indicated. Accordingly they would be advised and administered. In some instances, they do more or less good ; but in defiance of them, nine out of ten such cases inevitably die. I have repeatedly heard such cases referred-to, and cited afterwards, to prove the utter inutility of Antisbestics in medicine.

I have never seen Typhus nervosus so successfully treated, as by Antisbestics exclusively, from beginning to end; though this has not been my own practice, except in very malignant cases. I never however, used exhausting remedies in any stage; though I have commonly employed several agents that are Non-exhausting and Non-Antisbestic, for a certain time, longer or shorter in different instances. In a recent Southern medical periodical, I have seen a report of a number of cases of Non-malignant Typhus treated with the most satisfactory success, by Spiritus Vini Gallicus. The editor agreed with the reporter that this method might, in all probability, prove to be one of the best known methods for this disease. I think however, that I should be very loath to be restricted to one single principal remedy, in the treatment of any disease of importance. The Antisbestics produce the most speedy and decisive effects, when there is mere exhaustion without inanition. In such cases, they may be all the remedial agents that are required. But in cases of exhaustion with inanition, nutrition is always requisite, and in some instances may be all that is necessary; and when Antisbestics are required, they are inadmissible without the nutriment, or at least will do no good without it. This exhibits the reason why the exhaustion that occurs at the beginning of a malignant disease, is so much more manageable, and so much more speedily curable (since it is without inanition) than the exhaustion which occurs after the crisis of a severe and protracted Non-malignant disease; since in this latter case there is as much inanition as exhaustion. Increasing the energy and activity of the assimilating, secreting and excreting organs, when the system is in a state of absolute inanition, is like augmenting appetite and digestive power, and at the same time with holding all food for the stomach to elaborate. Indeed this last would actually be the case, if nutriment did not accompany the Antisbestics. It would be worse than keeping a mill in brisk action, without any grist. Instead of nutrition and reparation, there would be only attrition and wearing-out. The increased power and activity produced under such circumstances, would be fruitless and vain, and instead of diminishing, it must still further increase not only the exhaustion but the inanition. Exhaustion and inanition have no regular and uniform relation to each other in such cases. There may be extreme exhaustion with

little or no inanition; though there can hardly be extreme inanition, at least for any material time, without more or less exhaustion.

I believe it is now well understood that simple febrile diseases may be exquisitely atonic, so as not to contra-indicate Antisbestics; but judging from such professional acquaintances as I happen to have, in various parts of our country, and also from my professional reading, I should not judge that it is as well understood that the Phlogotica occur full as often in an exquisitely atonic state, and require a free use of Antisbestics, even from beginning to end; and that they operate just as kindly and just as favorably, as if there were no topical Phlogosis. In malignant, and even Non-malignant but intensely atonic Pneumonitis Typhodesnotha (i. e. Dysenteric Phlogosis limited to the bronchial membrane, the constitutional affection being a Typhus nervosus) I have seen Antisbestics as highly indicated, operate as favorably, and produce as great curative effects, as in any disease in which I ever employed them. They are equally indicated, and equally serviceable in numerous other Phlogotica. I may here be allowed to remark en passant, that there are many more Atonic-Phlogotica than Entonic ones, contrary to opinions that I have often heard advanced; and I may here add that of the eight or ten different specific Phlogoses, only one of them ever occurs in an Entonic form; though several of them at their outset are neither Entonic nor Atonic, as Diphtheritic Phlogosis, i. e. the peculiar and specific Inflammation of Croup for example.

It has been a prevalent opinion in various regions where I have been acquainted (and the same view may be found in books) that great caution is necessary to avoid administering Antisbestics too early in various Atonic diseases, and particularly in the several species of the nosological genus Typhus. There seems to be a vague apprehension that a too early use of this class of agents, in all diseases in which they are ever employed, but more especially in Typhus, must inevitably be productive of some serious ill effects, I never could ascertain exactly what is expected. Some seem to suppose that it would be productive of a sort of irremediable exhaustion; others that it would cause the patient to require large quantities of these agents before the end of the disease; and others still, that it would some how or other cause the case to ter-

minate fatally, when otherwise there might have been recovery. When ever I have made inquiry after the grounds of these opinions, they have never been defended, but some other apprehension has been specified, which has always been equally groundless and equally untenable. So far as I have had opportunity of observation, and so far as I have been able to obtain testimony from those who have been in the habit of employing Antisbestics in the early stages of atonic diseases, and particularly in Typhus, those cases have always got along the best, in which they have been employed the earliest. In highly malignant cases, I have always been in the habit of using Antisbestics from the very beginning of the disease; and there is the best reason for believing that they are equally well adapted to the very earliest stages of non-malignant cases. At all events I have received much testimony to this effect, from persons who have often treated such cases with Antisbestics exclusively from beginning to end.

Much is said about the ill effects of a habitual and protracted use of Stimulants, as a mere matter of sensuality, when there is no disease that requires them. For myself, I never knew any Antisbestic that was not at the same time Euphrenic, ever used in this way; nor do I think that a Non-Euphrenic Antisbestic ever was so used. Those who talk of such use of what they call Stimulants, tell us that they produce torpor and insusceptibility, and ultimately loss of tone, exhaustion or debility, first in the organs of primary digestion and second in the system at large. Now this is certainly not at all applicable to Antisbestics, Oresthetics or Erethistics, since none of them are ever used in the manner specified. The effects of the Euphrenics, the only articles ever employed in this manner, I have already discussed elsewhere. I am inclined to think that most of these notions and opinions have originated from the observation of the effects of a habitual and protracted use of Wine and Alcohol. But these articles possess several other different and distinct powers beside an Antisbestic power, and their operations and effects, when employed in this manner are altogether unique and different from any other article of their respective classes. To whatever power or powers their morbid effects may be attributable, I do not think that any of them can be ascribed to their Antisbestic operation, so that we may safely conclude that the no-

tions and opinions under consideration have no real applicability to the Antisbestics. I do not know that the simple and pure Antisbestics ever produce any morbid effects whatever.

By gradual and regular increase of dose and quantity in the twenty-four hours, from the smallest amount that is operative, we may increase the degree of Antisbestic effect to a certain point, beyond which increase no longer occurs. Beyond this point, increase of dose and quantity in the twenty-four hours does not seem to produce any additional effect at all, till the stomach begins to be oppressed and consequently disturbed by the mere bulk of the medicine. If the increase is still continued, the medicine will finally be rejected by vomiting, with no other ill effects, than the act of vomiting may some times occasion in particular cases and in particular circumstances. In short, the maximum amount of Antisbestis that is ever capable of being produced, never amounts to disease, but always (as appears to me) falls short of it.

I have often seen the assertion in books, and I have much oftener heard it from physicians, that an excessive or inordinate quantity of an active Stimulant would produce Phlogistic, Sthenic or Entonic Diathesis, and if pushed still further would produce a topical entonic Phlegmonous Phlogosis. I think I can say positively and confidentially that this is not true of an Antisbestic power. This power is assuredly, wholly and utterly incapable of exerting any such operation, or of producing any such effects. But (as I have elsewhere said) the most limited acceptation of the term Stimulant among physicians comprises the Erethistics, the Euphrenics, the Oresthetics and the Antisbestics, neither of which are capable of producing the effects in question. Out of all the articles belonging to these four classes, some of the Oresthetics only are capable, in excessive and inordinate quantities, of producing a topical atonic Erythematic Phlogosis, always accompanied with an atonic diathesis of greater or less intensity. The pure Antisbestics seem to be intirely incapable of destroying life in any doses and quantities, at least so far as I have been able to ascertain.

Perfectly pure Antisbestics would seem to exert all their influence upon the involuntary motor nerve of chymical action, nutrition and reproduction, commonly called the great sympathetic nerve; and the manifestations of this influence are always much

the most prominent, in that part of it, which is sent to the circulating system ; the next most prominent, in that part of it which is sent to the alimentary canal ; and the next most prominent, is that part of it which is sent to the organs of reproduction. The active Antisbestics produce a greater amount of Aphrodisiac effect than any other agents in the *materia medica* ; and this effect seems to be direct. I do not think that in this case, or any other within my knowledge, this operation depends upon a peculiar and specific power, but always upon some other power well known, and the foundation of some other class. This is an operation on a certain part of the nerve of chymical action, nutrition and reproduction. An Aphrodisiac operation is oftener required in the practice of medicine than perhaps many would suppose, since *Agenesia Impotentia* is by no means an uncommon disease. I have often had occasion to prescribe for symptomatic cases, and some times for what seemed to be pure and unequivocal idiopathic ones. As appears to me, the secernents and absorbents or, in other words, the glandular system, is much the least affected, if indeed it is affected at all. We commonly suppose however, that the Antisbestics rightly used, increase ultimate assimilation, which seems to me to be a function of the secretory or glandular system. Again the Antisbestics seem to have considerable power for the relief of that fluctuating Paresis, or incomplete or imperfect Paralysis of the pulmonary branch of the great sympathetic, the nerve on which the excretion of all the effete Carbonum of the system depends. This Paresis would seem to constitute the essential pathological condition of that very common disease *Dyspnœa exacerbans*, and perhaps of that exceedingly rare disease *Asthma verum*. Like all physicians who have been long in the practice of medicine, I have had very many cases of *Dyspnœa exacerbans* under my charge, and I can not remember ever to have failed of rendering more or less benefit in this disease, by the use of Antisbestics.

The reason of this difference in the degree of the operation of the Antisbestics upon these several parts, all of whose actions are equally dependent on the nerve of chymical action, nutrition and reproduction, I have always supposed to be peculiarities of function, and consequent peculiarities of organization and susceptibility, in the several subordinate parts. The sanguiferous system,

tions and opinions under consideration have no real applicability to the Antisbestics. I do not know that the simple and pure Antisbestics ever produce any morbid effects whatever.

By gradual and regular increase of dose and quantity in the twenty-four hours, from the smallest amount that is operative, we may increase the degree of Antisbestic effect to a certain point, beyond which increase no longer occurs. Beyond this point, increase of dose and quantity in the twenty-four hours does not seem to produce any additional effect at all, till the stomach begins to be oppressed and consequently disturbed by the mere bulk of the medicine. If the increase is still continued, the medicine will finally be rejected by vomiting, with no other ill effects, than the act of vomiting may some times occasion in particular cases and in particular circumstances. In short, the maximum amount of Antisbestis that is ever capable of being produced, never amounts to disease, but always (as appears to me) falls short of it.

I have often seen the assertion in books, and I have much often heard it from physicians, that an excessive or inordinate quantity of an active Stimulant would produce Phlogistic, Sthenic or Entonic Diathesis, and if pushed still further would produce a topical entonic Phlegmonous Phlogosis. I think I can say positively and confidentially that this is not true of an Antisbestic power. This power is assuredly, wholly and utterly incapable of exerting any such operation, or of producing any such effects. But (as I have elsewhere said) the most limited acceptation of the term Stimulant among physicians comprises the Erethistics, the Euphrenics, the Oresthetics and the Antisbestics, neither of which are capable of producing the effects in question. Out of all the articles belonging to these four classes, some of the Oresthetics only are capable, in excessive and inordinate quantities, of producing a topical atonic Erythematic Phlogosis, always accompanied with an atonic diathesis of greater or less intensity. The pure Antisbestics seem to be intirely incapable of destroying life in any doses and quantities, at least so far as I have been able to ascertain.

Perfectly pure Antisbestics would seem to exert all their influence upon the involuntary motor nerve of chimalical action, nutrition and reproduction, commonly called the great sympathetic nerve; and the manifestations of this influence are always much

the most prominent, in that part of it, which is sent to the circulating system ; the next most prominent, in that part of it which is sent to the alimentary canal ; and the next most prominent, is that part of it which is sent to the organs of reproduction. The active Antisbestics produce a greater amount of Aphrodisiac effect than any other agents in the *materia medica* ; and this effect seems to be direct. I do not think that in this case, or any other within my knowledge, this operation depends upon a peculiar and specific power, but always upon some other power well known, and the foundation of some other class. This is an operation on a certain part of the nerve of chymical action, nutrition and reproduction. An Aphrodisiac operation is oftener required in the practice of medicine than perhaps many would suppose, since *Agenesia Impotentia* is by no means an uncommon disease. I have often had occasion to prescribe for symptomatic cases, and some times for what seemed to be pure and unequivocal idiopathic ones. As appears to me, the secernents and absorbents or, in other words, the glandular system, is much the least affected, if indeed it is affected at all. We commonly suppose however, that the Antisbestics rightly used, increase ultimate assimilation, which seems to me to be a function of the secretory or glandular system. Again the Antisbestics seem to have considerable power for the relief of that fluctuating Paresis, or incomplete or imperfect Paralysis of the pulmonary branch of the great sympathetic, the nerve on which the excretion of all the effete Carbonum of the system depends. This Paresis would seem to constitute the essential pathological condition of that very common disease *Dyspnœa exacerbans*, and perhaps of that exceedingly rare disease *Asthma verum*. Like all physicians who have been long in the practice of medicine, I have had very many cases of *Dyspnœa exacerbans* under my charge, and I can not remember ever to have failed of rendering more or less benefit in this disease, by the use of Antisbestics.

The reason of this difference in the degree of the operation of the Antisbestics upon these several parts, all of whose actions are equally dependent on the nerve of chymical action, nutrition and reproduction, I have always supposed to be peculiarities of function, and consequent peculiarities of organization and susceptibility, in the several subordinate parts. The sanguiferous system,

the alimentary canal, the glandular system and the organs of reproduction, must obviously have such peculiarities.

The essence of the operation of the Antisbestics must be its peculiar quality, which we are utterly unable to define. We can only say that they produce a quickly diffused and transient increase of vital energy and strength of action in the parts dependent upon the great sympathetic nerve; but no body can suppose that the rapid and transient character of their operation, is all that distinguishes them from the Tonics.

As respects the names of this class, there can not be said to be any exact synonyma. The terms Stimulantia, Excitantia, Incitantia and Incitativa, as used by authors and practitioners of medicine, are perfectly synonymous among themselves, but are always used with considerably greater latitude than I give to the term Antisbestica. The most limited sense in which the terms Stimulant, Excitant, etc. are ever used by writers on the materia medica, comprehends the several powers which I have been in the habit of calling Antisbestic, Oresthetic, Erethistic and Euphrenic. As these several powers unquestionably differ essentially from each other, they ought to be distinguished, which can never be, so long as they are called by one and the same name. The diagnosis between these four different and distinct powers may be easily gathered from their definitions merely; and it is pointed-out specifically under each of the classes in their respective proëms. But the very definition of the Antisbestics, is the diagnosis of this class in contradistinction from the other three.

The following may be taken as a good specimen of the commonly received definitions of this class of agents. "*Stimulantia, medicamenta motum sanguinis et calorem corporis augentis.*" (*F. Swed. Mat. Med. Paris. 1800, Pagin. 492.*) By increased motion of the blood must be understood increased frequency of the pulse. "*Incitantia and Incitativa, quæ omnes functiones corporis incitant, absorptiones et secretiones promovent, et calorem naturalem augent.*" (*Ibidem, Pg. 499.*) I do not think that there are any articles in the materia medica that "*omnes functiones corporis incitant.*" An increase of secretion and absorption is certainly no part of an Antisbestic operation. All that remains of this definition is then that Stimulants increase the natu-

ral heat, which Antisbestics truly do, in certain circumstances, but not always. But this assuredly is not the whole of an Antisbestic operation, nor even an invariable part of it.

It should be mentioned in this place that the terms Stimulant, Excitant and Excitative, have been used with much greater latitude than any other terms in medicine, or at least in the *materia medica*. It is a common doctrine of many, with whom I have conversed, that, as all agents capable of affecting the animal system, always act by impressions upon some part or parts, by means of which they change sensations and actions, or in other words, condition, so all articles that are capable of exerting any power, or occasioning any operation or effects, must of necessity be Stimulants, since the *modus operandi* of every article is in fact Stimulant. According to this view, Stimulant is more comprehensive than any other term in the *materia medica*, or even in medicine at large, since every thing that acts at all upon the animal economy, is alleged to act in this manner, and accordingly all the causes of disease are maintained to be Stimulants. I have thus mentioned the most limited, as well as the widest acceptation of this term, and shall not mention any of the intermediate limitations of it, as they are mostly loose and indefinite. I believe that very few physicians ever use this term with any particular uniformity of acceptation, or are always prepared to answer in what exact sense they do employ it. I think that I have already said enough to justify my previous assertion that the word Stimulant is the vaguest term in medicine.*

The first four grades of a Euphrenic operation, viz. the obviation of languor and lassitude when it exists; the production of a peculiar calm, placid and pleasant sensation; the production of a peculiar and rather agreeable preternatural wakefulness; and the positive exhilaration in a greater or less degree; are generally if not universally called Stimulation; and consequently are supposed to be the operation required, where Antisbestis is really needed. Even De Quincy makes this mistake as well as the physi-

* It may perhaps be worth mentioning in this place that the term Stimulus signifies an ox-goad or a spur; and that it is said to be derived from a Greek verb signifying to prick. In the Latin language there are only six words derived from Stimulus, viz. Stimulo, a verb; Stimulatio and Stimulatus, Stimulator and Stimulatrix, nouns-substantive; and Stimuleus an attribute.

cians. Oresthetics and every thing which possesses acrimony or pungency, are generally if not always reckoned as Stimulants. If my distinctions between the four classes that, in the most limited acceptation of the terms, have been confounded under the denomination Stimulant, Excitant, Incitant and Incitative, it can not but be perfectly obvious that where an Antisbestic is indicated, the employment of either an Erethistic, an Oresthetic or a Euphrenic, in its stead, must result in utter disappointment as respects the desired medicinal effects. This I had abundant opportunity to realize in that intensely atonic epidemic called Typhus Syncopalis. In this disease, the utter worthlessness of either Oresthetics, or Euphrenics, where Antisbestics were indicated, was thoroughly ascertained by abundant trial and experience. It was in this disease that my attention was first called to the difference between these classes, and in which the foundation for their discrimination was first laid with me. When vital energy and strength of action are naturally deficient and are still waning, all the Erethistics, Euphrenics and Oresthetics that a patient can possibly swallow, will not contribute to obviate a particle of the exhaustion of a truly malignant disease; and will not in any degree hinder its progressive increase; while Antisbestics will save numbers that, without them, would inevitably die.

After I was myself an instructor in a public medical institution, I once happened to be in a large city, where there was a great medical school. Having a little more than an hour's leisure, I succeeded in obtaining admittance to a lecture on the theory and practice of medicine. I supposed at the time that I should be wholly unknown to every body in the lecture room, but this proved to be an error. Immediately on my obtaining a seat (as I learned subsequently) the lecturer changed his subject wholly and intirely (as was believed by some of his audience) for my especial benefit. What I heard, related to the treatment of diseases of extreme exhaustion, and more especially of highly malignant epidemics, or such as had very few pathological conditions except extreme exhaustion. The discourse was principally upon the great mischief of the use of Stimulants in the diseases specified. They were absolutely interdicted as highly pernicious, and even very dangerous in all such cases. The lecturer declared that he had often seen them employed in the diseases under consideration,

that he had never witnessed the least benefit from them, but on the contrary, much evil. I never saw a man more earnest in his opposition to any thing; and yet it appeared to me that his opposition sadly lacked reasons and arguments, and even facts, with the exception of his own negative experience. There was even a deficiency in regard to this experience, since there was no specification of any of the articles which he had employed as Stimulants; nor of their doses; their periods of repetition; the quantities taken in the twenty-four hours; nor the length of time their use was continued; nor of the stage of the disease when their administration was begun. If medicines which directly increase vital energy and strength of action, are not admissible in diseases whose principal and controlling pathological condition is extreme exhaustion of vital energy, and great deficiency of strength of action, I can not imagine where they can possibly be useful; and if such diseases must not be treated by such agents, I am very ignorant as to what is indicated. This the lecturer did not tell us. His discourse was a vehement protest against the practice in question, not only on the score of its utter inutility, but on the additional ground of its positively injurious effects. The influence of the lecture upon me at least, was not in all probability, what was expected, but rather the contrary. I was informed afterwards that the lecture was deemed peculiarly practical and valuable by the students generally if not wholly. For myself I concluded that the lecturer could only have employed the Antiphlogistic or directly exhausting Oresthetics and Euphrenics as Stimulants, but never the true Antisbestics. (I think it must have been from witnessing the effects of such articles, incorrectly considered as Stimulants, in the sense in which I employ the term Antisbestics, that the doctrine of "indirect debility" in part originated. First and last I have met with a considerable number of physicians who utterly reject all use in medicine, of all articles reckoned Stimulants. Whenever I have had opportunity to converse with any of these gentlemen, I have uniformly found that their notions and prejudices originated from the observation of the effects of the Antiphlogistic or directly exhausting Oresthetics and Euphrenics that were destitute of all Antisbestic power, which they had been in the habit of employing under the name Stimulants.

A professional acquaintance of mine practised medicine many

years, without having to treat any diseases of any material degree of exhaustion. At last, he was astonished and confounded by the appearance of an epidemic of this character, in the place where he had resided long, without witnessing any such phenomenon. He soon became satisfied, as the result of trial and experience, that his previous routine of practice was not only useless, but much worse. He was shocked to find that he was not only losing the confidence of his old employers, but his patients too, and in such a manner that they could never employ him again. In this dilemma he called to mind what he had heard about the use of Stimulants, in what he supposed must have been similar cases. He determined to enter immediately on this method of practice, to the exclusion of measures, which he had just found to produce nothing but disastrous effects. After what he considered an exceedingly fair trial of Stimulants, both in large and small quantities in the twenty-four hours, and in large and small doses at very various intervals, he finally came to the conclusion that they were utterly worthless. He did not lose so many of his patients, after relinquishing his old measures and medicines, but he thought it clear that his new medicines rendered no service. The consequence was that he finally treated his cases with nothing but placebos. On his making this statement to me, after the epidemic had passed-off, I inquired what the Stimulants were that he had employed. His reply was, Capsicum and various other acrid and pungent articles; Common *Æther*, and also some of the Saline *Ætheres*; Ammonia commonly so called, and some of the Salts of Oxyd of Ammonium. He had not used a single Antisbestic, i. e. an article capable of increasing vital energy and strength of action in any part of the system. But even by the most intelligent and observing of those professional gentlemen who still persist in calling Musk, Common *Æther*, Ammonia and Capsicum Stimulants, it will be acknowledged that neither of these articles affects the sanguiferous system, at least in the way of increasing vital energy and strength of action, while it is well known that Alcohol and Wine do this, in an eminent degree. I have known individuals, who from not understanding the difference between what I call Antisbestics, and what I call Oresthetics, Euphrenics and Erethistics, had some times rejected one of these classes, some times an other, and some times the whole, because they were

not what they were reported to be. From the fact that physicians always confound Erethistic, Euphrenic and Oresthetic powers with an Antisbestic power, the three first mentioned are constantly employed in cases where Antisbestics are really indicated, from which of course disappointment as respects the desired effects always results, if nothing worse. It is not at all surprising that a gentleman, who has always made this mistake, should lose all expectation of benefit from Stimulants; and where he has been in the habit of using Ammid of Hydrogen and the several *Ætheres* ordinarily found in the shops, as Stimulants, there is no wonder that he should have found them positively injurious in diseases, whose principal and controlling pathological condition is extreme exhaustion.

A distinguished medical gentleman, apparently a man of great natural bodily vigor, once said to me that he never could bring himself to tolerate in his own person such powerful Stimulants as Tea and Coffee. I inquired what he used in their stead. His reply was, Water, and some times Milk and Water. Pure Milk he considered as altogether too Stimulating for himself, and accordingly while his wife regaled me at a peculiarly delicate but luxurious table, on which there was remarkably fine Coffee as strong as I could wish, with all appropriate accompaniments, he sat by, eating bread and milk apparently much diluted with water. Now I can affirm with the greatest confidence that neither Tea nor Coffee ever increased vital energy and strength of action in the sanguiferous system, or in any other of the subordinate parts dependent upon the involuntary motor nerve of chiminal action, nutrition and reproduction, and I will leave it to the decision of my readers whether Milk ever operates in this manner or not. But what sort of success would a physician with such notions be likely to have, in the treatment of those diseases which consist almost wholly in extreme exhaustion; which are scarcely capable of being affected in any degree favorably, by any thing but a free use of the most active Antisbestics; which may generally be saved by a timely use of a sufficient quantity of these agents; but which usually die speedily without, and some times in a few hours?

As I do not apply the term Antisbestic, as any author or practitioner within my knowledge has ever applied the term Stimu-

lant and all its equivalents, before me, I trust I shall be permitted to use my own term in my own way, leaving the term Stimulant and all its equivalents, to be used in the manner that best suits authors and practitioners, either generally or individually.

The term *Analeptica* is often applied to articles possessing one or more of the four powers commonly confounded under the terms Stimulant, Excitant and Incitant. It is a sufficiently good term, is pure Greek; and I once contemplated employing it instead of Antisbestic. But the fact that it has been so long applied with too much latitude, I judged might spoil it. I feared that physicians would still apply it to Oresthetics, Euphrenics and Erethetics, as well as to Antisbestics, and I determined to give it up, and to adopt a term that had never been misapplied. The following is one of the best definitions of the *Analeptica* to be found in books, bad as it may actually be. "*Analeptica medicamenta corpus languidum refocillantia et vires restaurantia*" (*F. Swed. Mat. Med. Paris. 1800, Pg. 460.*) Although as a definition this is grossly incorrect in some respects, yet the last clause, as appears to me, sufficiently evinces that what I call Antisbestics are intended.

So far as I understand the application of the term, the appellation *Cardiaca* must be intended to comprehend the Antisbestica; but the common definitions are so general and so vague, that it is difficult to determine what they are intended to comprise; and as far as I have had opportunity to judge by observation, their application is equally loose. One of the most common definitions of this term is as follows, viz. "*Cardiaca appellavi quæ motum cordis et systematis arteriosi augment.*" (*Ibidem, Pg. 11 Conspectus.*) Now what is meant by increasing the action of the heart and arterial system? Almost all the physicians that I have known, (except a small circle, with whom I was educated professionally) understood by this, increasing the frequency of pulsation. I could mention a multitude of printed authorities to the same effect, but one will suffice, viz. John Mason Good. He considers preternatural frequency of pulsation as even indicating Phlogistic diathesis, as well as Stimulation. Now I have repeatedly known great losses of blood increase the frequency of the pulse to a hundred and fifty, sixty, seventy-five, and even two hundred in a minute. According to the view

just mentioned such losses of blood are very powerfully Stimulant. This term is Greek and therefore is not objectionable on account of its origin. Never the less I do not like it, and do not think that it would please the profession generally. Its intrinsic import, viz. articles acting upon the heart, is not inappropriate; but it has been used by far too long in a loose and vague sense, and always with considerably more latitude than I give to the term Antisbestica. I reject it therefore, without hesitation.

I suppose that the English term *Cordials* is in fact a mere translation of the Greek term *Cardiaca*, and yet I have met with the denomination *Cordialia*, and that employed in contradistinction from *Cardiaca*, though in what precise sense, I could not determine to my own satisfaction. I doubt whether the case was capable of determination.

I have often known the terms *Restaurantia* i. e. articles which restore from disease to health; *Recuperantia*, i. e. articles which contribute to the recovery of strength and health; and *Refocillantia*, i. e. articles which invigorate or strengthen, used for this class. So far as import is concerned, either of these terms might be made to answer sufficiently well, though they would be as appropriate to the Tonics as to this class. The circumstance that they are pure Latin, and therefore not in analogy with the names of the other classes is sufficient to justify their rejection.

I do not know that any article exists, which possesses pure Antisbestic power, and this alone, and without any other in addition. This is a remarkable point of difference between this, and the powers on which most of the other classes are founded. In nearly all the other classes, there is a group of articles, some times small and some times large, which possesses no other power, except that on which the class depends. This was once mentioned to me as an objection to the admission that an Antisbestic power is a distinct specific power, not identical with any other that I have mentioned. There is however no power, which ever accompanies that of an Antisbestic, that does not occur separate and distinct from any degree of it whatever; and on the other hand, an Antisbestic power occurs in conjunction with a Narcotic, an Erethistic, a Euphrenic, an Oresthetic and perhaps in a few cases with a Tonic power, though this is somewhat questionable, also with a Diuretic and Diaphoretic power. This proves conclusively that

an Antisbestic power is different and distinct from every other power which I have made the foundation of a class.

On the whole as respects conveniently available articles, I consider this class as the most meager of all the classes of the *materia medica*. It is worthy of remark that the vegetable kingdom affords no Antisbestics. By this I do not mean to say that there is no vegetable article possessing a particle of Antisbestic power, but only that there are no articles possessing a sufficient degree of this power to be available in medicine, when Antisbestics are indispensable. I do not forget that *Papaver somniferum* is very generally reputed to possess the power which I call Antisbestic; but it is in such a moderate degree in comparison with its Narcotic power, that it is of little value as an Antisbestic where an active Antisbestic is necessary to save life. But *Papaver somniferum* is altogether a unique article in the *materia medica*, there being nothing else at all like it. Still I think that it is the most important vegetable Antisbestic now known, or that I am able at present to call to mind. It is quite possible that some efficient Antisbestics belonging to the vegetable kingdom, may yet be found among the Essential Oils (i. e. liquid compound radicals of H. C.) though no such are yet known. The animal kingdom affords a number of Antisbestics, but none which do not possess such a degree of Oresthetic power as to prevent their being pushed to such an extent as to answer the purpose when Antisbestics are the most indispensably important. The most practically valuable Antisbestics are those of chymical origin and are very few in number. I think we must look to the same source, and to that alone, for the increase of these important agents, if there is ever any increase. In fact there are but two Antisbestics, both of chymical origin, that have not some other power associated in such a degree with them, as to prevent their use to the necessary extent, in all the cases in which the Antisbestics are the most highly indicated, the most important and the most indispensable.

PROËM TO THE CLASS TONICA.

The term Tonica is ancient Greek. It is from a verb signifying *to stretch*; *to strain*; *to extend*; etc. Of course Tonica really means that which is accomplished by stretching; straining; or extending. In the sense of invigorants the meaning of this term is intirely figurative. In ancient Greek, the term Tonica signified *giving tension*; and also *invigorating*; the latter a sense in which I am not apprized that the ancient Greeks ever used the term Tonica; so that the former seems to have deserved the preference in modern medicine. *Tonos* is an ancient Greek term signifying with the ancients, the art of giving *tension* or *force*; etc. It may well be used in medicine to denote the effects of a Tonic. *Tone* is a modification of an ancient Greek term signifying *stretching*; *straining*; *tension*; etc. In medicine it is a healthy degree of vital energy and strength of action in all the subordinate parts of the human animal system, of which these qualities or attributes can be predicated. This term in Latin is commonly written *tonus*, which is merely the Greek written in Roman letters. The term *entonia* or *entony* is used in medicine to denote a preternatural and morbid degree of vital energy and strength of action in the sanguiferous system. *Entonia* or *entony* is made-up of the Greek preposition *en*, here performing the functions of a sort of intensive. The term *atony* denotes a morbid diminution of vital energy and strength of action as respects the vital functions merely, i. e. the functions discharged by the nerve of chymical action, nutrition and reproduction, or in other words the great sympathetic nerve so called. It must be observed that atony and general exhaustion are by no means the same thing. The former has its seat in the parts dependent upon the nerve of chymical action, nutrition and reproduction, while the latter involves all the subordinate parts of the system. There may indeed be considerable feebleness of the whole muscular system whether voluntary or involuntary without any atony in the strict sense of the term. It is atony and not muscular weakness, that indicates danger. *Atonia* or *atony* is made-up of the Greek term for tone and *a* privative.

Definition.—Tonica or Tonics are agents which directly produce a slow, gradual and permanent but moderate increase of vi-

tal energy and strength of action of a peculiar character, primarily in a part and secondarily in the whole of the human animal system. The following is a definition of Tonics more in detail, viz. they directly, gradually, moderately and permanently increase appetite and digestive power; they directly, gradually, moderately and permanently increase the strength and fulness of arterial pulsation; at the same time indirectly diminishing frequency when too great, and augmenting it when too little; they directly, gradually, moderately and permanently increase nervous and cerebral, or mental and muscular energy; and to all appearance, they directly, gradually, moderately and permanently increase the strength, with which all the other functions, viz. ultimate assimilation, secretion, absorption, excretion, etc. are performed; at the same time indirectly obviating morbid irritability, mobility and sensibility, on the one hand, or inirritability, insensibility or torpor, on the other hand; provided these states are connected with atony or general exhaustion. In addition to this, the Tonics, in appropriate cases, restore what is called the balance of the actions of the several subordinate parts of the system, when disturbed in connexion with atony or general exhaustion.

The definitions commonly found in books, are all more or less faulty; as I trust will be obvious, on a little consideration. It must be observed that a bare increase of appetite and digestive power, without a subsequent increase of tone in the system at large, does not indicate a true Tonic operation. It is said that a single full bleeding from a person in perfect health always increases appetite and digestive power, which effects are supposed to be an effort of the system to supply the waste which it has just suffered. I believe that if the bleeding, on the one hand, does not happen to be quite enough to make the system feel its loss, it fails of producing the effect in question; and on the other hand, if it happens to be so much as to weaken the subject materially, it produces an opposite effect; so that it is necessary to abstract just about the right quantity in order to get the operation specified. But Depletion of Blood is not therefore a Tonic. Even when it is practised exactly to the right amount, and does happen to increase appetite and digestive power, it does it indirectly, and through what has been called this *vis conservatrix-vel medicatrix natura*. I have often known those who call, or rather suppose

themselves veterinary practitioners in our country, to bleed horses for this purpose; and occasionally I have known them hit upon just the right quantity of blood which must be abstracted; but much more frequently they take too much, and do a great deal of mischief, making the horse weak for three or four months.

Some consider that every article, under the use of which disease gradually yields and health is gradually restored, is of course a Tonic; though I have much oftener known this sort of operation denominated alterative. It is my belief, in fact I have full conviction of it, that there are many agents which overcome disease and restore health in this manner, that never directly increase vital energy or strength of action in any degree. Of course they would not fall under what I consider to be the most correct definition of Tonics. It is said that Tonics were believed and defined by Linnæus to be articles which increase vital energy and strength in the muscular system only. I have no knowledge of any articles that ever affect the muscular system generally, in the way under consideration, without the previous operation either upon the organs of primary digestion, upon the nervous system generally, or upon the sanguiferous system, which I have already specified. In addition to this, I know of no article which ever increases muscular strength and energy, which does not affect various other subordinate parts of the system in a similar manner. It has always appeared to me that an efficient Tonic course, in an appropriate case, actually increases the contractility even of the cellular substance, as well as the vigor of all the other subordinate parts. Linnæus's view then (as appears to me) can not possibly be correct. It has been said that neither increase of appetite and digestive power, nor increase in the strength of sanguiferous action, are any certain indications of a true and genuine increase of tone, since both are said to be capable of being produced, while there is actually a diminution of the strength of the voluntary muscular system. I do not think that this is true, except in the disease called Synclonus Tremor, which is a Paretic disease, i. e. an imperfect or incomplete Paralytic affection, not a Spastic one, as it is commonly reputed to be. This disease some times proceeds so far that the patient can not employ the voluntary muscular system for walking, feeding himself, or any other useful purpose. In this disease I have known appetite and digestive power increased, and

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The definitions commonly found in books, are all more or less faulty; as I trust will be obvious, on a little consideration. It must be observed that a bare increase of appetite and digestive power, without a subsequent increase of tone in the system at large, does not indicate a true Tonic operation. It is said that a single full bleeding from a person in perfect health always increases appetite and digestive power, which effects are supposed to be an effort of the system to supply the waste which it has just suffered. I believe that if the bleeding, on the one hand, does not happen to be quite enough to make the system feel its loss, it fails of producing the effect in question; and on the other hand, if it happens to be so much as to weaken the subject materially, it produces an opposite effect; so that it is necessary to abstract just about the right quantity in order to get the operation specified. But Depletion of Blood is not therefore a Tonic. Even when it is practised exactly to the right amount, and does happen to increase appetite and digestive power, it does it indirectly, and through what has been called this *vis conservatrix vel medicatrix naturæ*. I have often known those who call, or rather suppose

themselves veterinary practitioners in our country, to bleed horses for this purpose; and occasionally I have known them hit upon just the right quantity of blood which must be abstracted; but much more frequently they take too much, and do a great deal of mischief, making the horse weak for three or four months.

Some consider that every article, under the use of which disease gradually yields and health is gradually restored, is of course a Tonic; though I have much oftener known this sort of operation denominated alterative. It is my belief, in fact I have full conviction of it, that there are many agents which overcome disease and restore health in this manner, that never directly increase vital energy or strength of action in any degree. Of course they would not fall under what I consider to be the most correct definition of Tonics. It is said that Tonics were believed and defined by Linnæus to be articles which increase vital energy and strength in the muscular system only. I have no knowledge of any articles that ever affect the muscular system generally, in the way under consideration, without the previous operation either upon the organs of primary digestion, upon the nervous system generally, or upon the sanguiferous system, which I have already specified. In addition to this, I know of no article which ever increases muscular strength and energy, which does not affect various other subordinate parts of the system in a similar manner. It has always appeared to me that an efficient Tonic course, in an appropriate case, actually increases the contractility even of the cellular substance, as well as the vigor of all the other subordinate parts. Linnæus's view then (as appears to me) can not possibly be correct. It has been said that neither increase of appetite and digestive power, nor increase in the strength of sanguiferous action, are any certain indications of a true and genuine increase of tone, since both are said to be capable of being produced, while there is actually a diminution of the strength of the voluntary muscular system. I do not think that this is true, except in the disease called Synclonus Tremor, which is a Paretic disease, i. e. an imperfect or incomplete Paralytic affection, not a Spastic one, as it is commonly reputed to be. This disease some times proceeds so far that the patient can not employ the voluntary muscular system for walking, feeding himself, or any other useful purpose. In this disease I have known appetite and digestive power increased, and

or from imperfect and incorrect observation of their effects when employed. Let it be here remembered that, "a Tonic is an article that increases vital energy and vigor of action, and this in a slow, gradual and permanent manner, in some subordinate part of the animal system." The simple bitters, such as *Gentiana lutea*, *Picræna excelsa*, *Cocculus palmatus*, etc. if properly prepared pharmaceutically, and properly administered, and in appropriate conditions of the system, certainly increase appetite and digestive power primarily; and if suitably continued, they certainly have every appearance of secondarily invigorating the system at large, in a greater or less degree. I have witnessed this too often, and too prominently, to leave room, in my own mind at least, for any doubt upon the subject. Again, *Cinchona*, and other analogous articles (of which the number is small in the present state of our knowledge) if efficiently used, and in appropriate cases, certainly increase vital energy and strength of action in the sanguiferous system primarily; and if suitably continued, they have every appearance of secondarily invigorating the system at large in a greater or less degree. I have seen an obvious and palpable increase of vital energy and strength of action in the sanguiferous system, within the period of twenty-four hours, from a suitable free use of *Cinchona* in *Periodicus Intermittens*, in *Typhus nervosus*, in *Rheumatismus acutus*, in *Gangræna Sphacelus*, and even in the various forms of *Struma*. And yet, strange to tell, I have not infrequently heard all Tonic power denied to the Alcaloids *Cinchonina*, *Quinina*, *Aricina* or *Cusconina* and *Montanina*, and also to all the Salts of the Oxyds of *Cinchoninum*, *Quininum*, *Aricinum* or *Cusconinum* and *Montaninum*; and I have heard it maintained that their effects were diametrically opposite, i. e. exhausting. But according to my judgment *Cinchona* is more truly and more eminently Tonic, than any other article belonging to this class, and may with more propriety be taken as the very type of the class. Still again, *Ignatia amara*, *Strychnos*, *Nux-vomica* and several other species of the genus *Strychnos*, if efficiently and appropriately used, certainly increase vital energy and vigor of action in the general nervous system primarily; and if suitably persevered in, they have every appearance of secondarily invigorating the system at large, in a greater or less degree. As appears to me, I have witnessed this, too prominently, and too often, to leave

room for doubt on the subject. It is true that I do not always witness these effects, in every case, in which I ever prescribe these three groups of articles, either (as I suppose) on account of some imperfection in my judgment as respects the indications of treatment; or because what I prescribe is not properly digested or taken; or in consequence of the intrinsic incurability of the case.

The Tonics, I believe, are always more or less Aphrodisiac, but they are both less prominently and less speedily so, than Antisestics.

In order that many of the Tonics should sit pleasantly upon the stomach and affect the patient agreeably, it is often necessary that they should be regularly accompanied with some light, nutritious and easily digestible food. I have often been consulted by patients, for whom Tonics were highly indicated, but who imagined they could not "bear them," as the statement was. On investigation I found that but little food was taken, and this never in connexion with the medicine. On the patient's taking half a cupful of Milk Porridge, Rice Porridge, decoction of the Fæculæ of Arrow-root in Milk, or some thing else similar, the medicines agreed perfectly, and produced all the desired effects. The Salts of Cinchoninum, and Quininum, when ever taken with considerable freedom, always affect the patient more kindly and favorably for being accompanied with some such food as that above specified. When ever I have occasion to administer a large dose of any of the above mentioned Salts, I always direct the patient to take half a tumbler of Milk at least, along with it, if nothing more preferable is at hand. If this is done, these medicines never disagree, never disquiet the stomach, and are much less liable to produce tinnitus aurium.

The best substitutes for Tonics are Antisestics administered in small doses, and at much shorter intervals than is usually necessary for the Tonics. If continued for a considerable time in this manner, their effect is much like that of the Tonics. In some chronic cases, in which at a certain stage, Tonics had been highly indicated, but had not been employed till the patient had passed to too great a state of exhaustion to be affected by Tonics, I have often known Antisestics managed in this manner, to accomplish all that is desired. A priori, good natural (not facti-

tious) Wine would seem as if it must be one of the best Antisbestics to be employed as a substitute for the Tonics. Unfortunately however, either from the bad quality of the best Wine that we can obtain, or from our not being accustomed to its use, or from some peculiarities of constitution resulting from our climate, or (to speak with perfect safety) some other cause, it is not generally relished among us, and is certainly exceedingly liable to become acid in the stomach, and to disagree in some way. When having occasion to administer Wine as a substitute for a Tonic, it has become sour and disagreed with the stomach, I have known the difficulty remedied by the addition of Tincture of *Oantharis*, or of Tincture of *Amomum Granum Paradisi*. These additional articles need not absolutely be mixed with the Wine, unless the patient chooses. All that is necessary is that they should be taken at the same time. But still there is a very considerable difference in the quality of the invigoration produced by the Antisbestics and by the Tonics. As I have else where said, there is a much greater difference between Tonics and Antisbestics, than the definition can be well made to imply, viz. a difference in quality which can not well be specified. That such difference in the quality of their action exists, we know from their operation, and from the different manner in which they affect disease, but exactly what this precise quality of each may be, we do not now know, and in all probability never shall.

That group of Tonics the primary manifestation of whose operation is in the organs of primary digestion, is very numerous. It seems to be a common opinion with writers on the *materia medica*, and also with very many practitioners of medicine, that simple and pure bitter Tonics, numerous as they are, are very nearly if not quite identical in their medicinal operation and effects, and therefore that one of them is just as good as the whole, and that more than three or four of them must be an incumbrance to the *materia medica*. Now this is undoubtedly a very great error. It may indeed be difficult to specify in words the peculiarities of each individual of this group of articles, in comparison with the rest; but no observant and experienced physician, who has ever prescribed any considerable number of them, can possibly doubt that every individual of them differs more or less from all the rest. I have been much accustomed to prescribe a considerable number

of them in the pharmaceutic form of as strong a Tincture as I could well make, so strong that a fluidrachm would constitute a full dose. In this shape they may be kept perfectly well for almost any length of time; requiring no preparation by the patient except dilution with a little Water and the addition of Sugar to the taste; and, as I think, operating better than in any other form. Along with these simple bitter Tinctures I usually kept a Tincture of *Alkanna controversa* (*De Cand.*) a little of which I used to add to the bitter Tinctures when I dispensed them, for the express purpose of disguising them. When a patient applied for a new quantity of any one of the bitter Tinctures, I very frequently changed it, likewise disguising it with Tincture of *Alkanna*. When the several bitter Tinctures could not be distinguished by the patient, either by appearance, odor or taste, I was frequently told that I had given-out a new medicine. When I inquired why it was thought so, the answer would be "it makes me feel different." By this method of management, I learned that some of the simple bitter Tonics were much to be preferred to others, in those cases where it is considered to be perfectly immaterial which is employed. Except by the course that I took, I do not know how else I could have arrived at a knowledge of such facts—facts which I deem valuable, and even important. On the whole, I have become satisfied that the operation of no two of them is ever exactly the same, except when they are very nearly allied. Several cases of this sort I have specified elsewhere. It is true we cannot specify in precise terms what their differences are, and we are obliged to say of the whole group that it is adapted to a certain set of cases, without any attempt at discriminating which individual article is best adapted to each individual case; and yet, for the best success, it is often necessary to change one for an other. It is very frequently the fact that, in a given case, one of these articles is inefficacious and offensive, when another is not at all disagreeable and produces all the desired effects. Occasionally we can judge very well when a particular article is to be preferred; but far oftener we can ascertain only by trial. I know of no method, except that which I formerly employed, of attaining to the desired knowledge. At all events, I deem it to be important to have a large catalogue to select from.

That group of Tonics the primary manifestations of whose operation are in the nervous system, so far as at present known, consist of a few species of three genera only. Their peculiar character as Tonics is not recognized by the medical profession generally; indeed they are scarcely known as Tonics at all; though they are as valuable for their peculiar operation, as the articles of any other group are for theirs.

It is to the group of Tonics the primary manifestations of whose operation are first perceived in the circulating system, that the term Febrifuge is commonly applied; but they are Febrifuge only in Periodical Fevers. Over these they exert an absolute control; but they do not arrest any species of Typhus; and Cauma they would greatly aggravate. The term Febrifuge therefore is not a happy distinctive epithet for this set of Tonics; but as I know of no better one, I shall be constrained to employ it, little as I like it. The power of this group of Tonics to arrest the Periodical or Intermittent part of a Remittent (which is always a compound of Intermittent with some one of the eight or nine species of Typhus) is expressly recognized by the earnest caution so often given to avoid the use of Cinchona in Remittent, because it will "convert it into Typhus;" and so it will assuredly do, since it will absolutely cure the Periodical or Intermittent part, leaving the Typhus not at all aggravated, but rather mitigated, to progress by itself, because it is not thus curable. Now the cure of one part of Remittent, having the other uncured, is commonly reprobated, being reckoned exceedingly bad practice. For myself however, I always deem it better that a patient should have one disease only instead of two; and therefore I always cure the curable part, especially as my remedies do not aggravate, but on the contrary mitigate the remaining part. The method recommended by some authors, and by many practitioners, for the treatment of Remittent, is to avoid any thing appropriate for the Periodical or Intermittent part of the disease, till the Typhus part of it has run its complete course, come to its final crisis and passed-off, because by this means, "we convert the disease into an Intermittent." But when the disease is non-malignant, at least a fortnight, and some times three or even four weeks is necessary for the Typhus part of it to pass-off, when the patient is often in such a state of exhaustion as to pass-off likewise. When the disease is malig-

nant, the Typhous part of it is usually ended with the first week, and the patient also. Now I greatly prefer "converting the disease into a Typhus by curing the Periodical or Intermittent part of it, as soon as possible, and then treating the Typhus in the best manner in our power.

The reason why the Febrifuge Tonics (so called) do not cure Typhus as well as Intermittent, would seem to be owing in part to the fact that the atony of the sanguiferous system constitutes only a comparatively unimportant portion of the pathology of the former, while it is the principal pathological condition of the latter. In reality, the pathological condition of the nervous system seems to be far more important in Typhus than in Intermittent. Hence the Erethistic, Euphrenic and Antisbestic Narcotics seem to be of more importance in Typhus than the Febrifuge Tonics. An other reason why the Febrifuge Tonics are of so much less importance in Typhus than in Intermittent is the fact that the two diseases are regulated by intirely different laws as respects their course, progress and termination. If Typhus is not arrested in its forming stage, it must go through a regular course, and it must terminate by a crisis at a regular critical period. Medical treatment can only determine its crisis to be at an earlier or later critical period, or cause it to be a favorable or unfavorable one. Intermittent on the contrary may terminate with any individual paroxysm; and even the paroxysms may be shortened or lengthened, according to the judiciousness or injudiciousness of the treatment.

But the Febrifuge Tonics are important, as I think I have sufficiently good reason to know, for one purpose in relation to Typhus, viz. for prophylaxis. This I first observed, in consequence of employing the Salts of Quininum as prophylactics of the Intermittent part of Remittent, during the prevalence of an endemic of this latter disease, in the course of which I found that nobody who took this medicine had Typhus any more than Intermittent. Subsequently Cinchona some times in one form of preparation, and at other times in an other, was employed as a prophylactic, during an epidemic of Typhus, and when the medicine was used freely, nobody who took it had Typhus. Many of those who used it in this way, had symptoms of predisposition to the epidemic. It is true that this escape from the disease under the use of Cin-

chona does not actually prove any thing, because, during an epidemic, large numbers always have symptoms of predisposition, who finally escape the disease; still however, as every one who took the supposed prophylactic with any efficiency, failed of being affected by the epidemic, it renders it probable that Cinchona is actually a prophylactic of Typhus, which probability must hereafter be converted into certainty by a sufficient number of additional observations of the same sort, or disproved by opposite results. The proof in such a case must inevitably be of a negative character, since the subject admits of no other.

The group of Tonics, the primary manifestations of whose operation is in the sanguiferous system is very limited, and are probably all derived from a single natural order, perhaps from a single tribe of this order, and possibly from a single genus. But in relation to this subject there is a great deficiency of accurate and definite observations that are worthy of full reliance. The whole of the articles recommended for the cure of Intermittent, which I have had opportunity to test fairly, except certain species of Cinchona, have invariably failed in all intense cases of this disease. Slight and trifling cases may some-times be cured by almost any thing. Slight shocks and tricks that make considerable impression upon the mind for the time being, will arrest the disease in certain subjects; but no reliable experience is ever to be derived from such cases of any disease.

We very often hear, not only from non-medical persons, but from physicians, of medicines being too bracing! Now what is meant by this? To brace implies "to bind; to tie close with bandages; to strain-up; to make tense." These are all the significations assigned to this word, by Dr. Johnson. I am not apprised that this word has any particular technical signification in medicine; but as in two of the senses above mentioned, it coincides with the etymological signification of the medical term Tonic, I have always supposed that the use of this term in this way, is intended to imply, to give tone, or in other terms definitory of these, to produce directly a slow, gradual, and permanent increase of vital energy and strength of action, of a peculiar quality, either in a part or in the whole of the human animal system. If this is not the sense of "to brace" in reference to the human animal system, then I still have its import or meaning to learn. But is there

any article or agent at present known, which has the power of bracing either too rapidly or too much in this sense of the term? Is there any article or agent known which is capable of directly producing too rapidly, or in too great a degree, a slow, gradual and permanent increase of vital energy and strength of action of a peculiar quality, either in a part, or in the whole of the human animal system? If so, I have yet to learn what it is. If the thing is practicable, I have yet to become acquainted with the evidences of it. I have even no knowledge of any article or agent that is capable of producing a phlogistic or entonic diathesis, i. e. in other words, a preternatural and morbid degree of vital energy and strength of action confined to the circulating system. If this were the fact, i. e. if agents were known which are capable of producing entonic or phlogistic diathesis, it would afford no evidence that such articles, or any other, were capable of proving "too bracing," or in other words too powerfully Tonic. Tone, or in other words, a healthy degree of vital energy and strength of action in all the subordinate parts of the human animal system, of which these qualities or attributes may be predicated, in a condition essentially different from entony or phlogistic diathesis. What are the operations and effects that are considered indicative that an article or agent is "too bracing," or in other words, excessively Tonic?

It seems to be a prevalent belief that Tonics, when long continued, ultimately exhaust the vital energies generally. I am perfectly confident that this can not be true of mere and pure Tonics, because I have had much testimony and considerable experience to the contrary. Professor Eli Ives of Yale College, once informed me that he had known Cinchona used five years without intermission, and also without being followed by any degree of exhaustion whatever. Indeed he said that the health appeared to improve, and the system to become stronger during the whole time. An author which I read many years ago, but whose work I now have not access to, states that a patient of his, by his advice, took Cinchona (if I remember aright) for twelve years with most manifest advantage, his health and vigor regularly though slowly improving the whole of this time. A medical acquaintance of mine, who was a confirmed invalid, took Tonics of various sorts, for more than twenty years. From time to time he tried a

very positive or unequivocal evidences of the last. The essence of the operation of the Tonics (as the definition implies) is an increase of vital energy and strength of action, though as I have already said different from that of the Antisbestics. The group, the primary manifestations of whose operation are in the nervous system generally, instead of being limited in its influence to the effects of a Tonic, is capable of producing both Erethism and Adeuagy, as well as increase of tone.

So far as I have knowledge the Tonics are utterly incapable of destroying life.

This power has been long known and recognized, and a class in the materia medica has long been founded upon it; but I believe that the name Tonica is not as old as the class, or the knowledge and recognition of the power. The synonymy of this class is smaller than that of almost any other in the materia medica. The class has some times been call *Roborantia* and *Corroborantia*, two terms of essentially the same signification; and so far as this is concerned, they are appropriate enough; but being pure Latin instead of Greek, they are contrary to the rule. The term Tonic though figuratively used, or employed upon a false hypothesis, has always had the precedence with writers on the materia medica. The terms *Stomachica* and *Cardiaca* have some times, though not very often, been applied to the Tonics. If the former had been applied to that group, the primary manifestations of whose operation are in the organs of primary digestion, and the latter to that group, the primary manifestations of whose operation are in the heart and arteries, it would not have seemed to be amiss; but I never knew any such distinction made in the use of the terms; nor did I ever know it made in regard to the Tonics, till I made it myself. We often read and hear of *Restaurantia* or *Restaurativa*, in English *Restoratives*. These terms have some times been applied to Tonics, and some times to Antisbestics. Generally however, I imagine they have been used without much consideration as to what power or operation they did imply. I think they may be mentioned as synonyms of the term Tonica, but such as no physician will be inclined to adopt, on account of their vagueness. The fact that they are pure Latin is another objection. We some times meet with the modern Latin term *Invigorantia* and the English *Invigorant* applied to this class. So far

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temporary suspension of them, but never being as well without them, he invariably resumed them again. Cinchona was the article most employed, but the simple bitter Tonics were often used, and with them some preparation of Iron. Iron was never taken alone. Several times a preparation of Zinc was tried as a substitute for the Iron, but it always did injury. For myself I came to the conclusion long ago, that Zinc possesses no Tonic powers, but that on the contrary, if freely used (in doses short of the nauseating point) it often impairs tone, and not infrequently, even when it is accompanied with simple bitters. This gentleman's health was always better when he was under the influence of Tonics; and I never entertained a doubt but that their use not only made him more comfortable, but actually protracted his life. This patient was congenitally feeble; of an exquisitely Strumous habit, but without any development of Struma. He had one severe attack of Rheumatismus acutus, under which he was moved only upon a sheet, for about three months. During the whole of this disease he was efficiently treated with Antiphlogistics and nothing else. After this he had a protracted Intermittent of more than a year's duration. All this happened when he was a young man, and before he entered the medical profession. Subsequently he suffered an attack, of about three month's duration, of Rheumatismus aberrans, or primarily misplaced Rheumatismus, during which he was visited and prescribed for by thirteen of the most distinguished physicians of the State in which he resided, not one of whom pretended to decide on the true nature and character of his disease. This malady left him with organic or structural affections. From this statement I imagine there will be but small doubt that he was a legitimate subject for Tonics.

With the exception of that small group, the primary manifestations of whose operation are in the nervous system generally, probably all the direct operation of the Tonics is exerted upon the involuntary nerve of chymical action, nutrition and reproduction; and even the excepted group exerts as much operation upon this nerve as any other group, though its operation is not confined to it. It affects the voluntary nervous system prominently; the nerves of special sensation though moderately; and the nerves of expression and common sensation to a greater or less extent, as is commonly believed, though I do not recollect ever witnessing any

very positive or unequivocal evidences of the last. The essence of the operation of the Tonics (as the definition implies) is an increase of vital energy and strength of action, though as I have already said different from that of the Antisbestics. The group, the primary manifestations of whose operation are in the nervous system generally, instead of being limited in its influence to the effects of a Tonic, is capable of producing both Erethism and Adenagy, as well as increase of tone.

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as signification is concerned, this appellation is well enough ; but as I have had occasion to say repeatedly, Latin names for the classes are interdicted, unless all are reduced to Latin.

Cullen taught that "the bitter principle" (as if there were but one "bitter principle" in nature) is the abode of the Tonic power. This is very far from being correct. Papaver and Digitalis are bitter, and yet they are not at all Tonic. The fruit of Citrullus Colocynthis is most exquisitely and intensely bitter, and yet it is in no degree Tonic. Ferrum and a considerable number of its compounds are commonly considered to be Tonic, and yet they are not bitter. It has certainly been by far too common in the materia medica to consider every thing that is bitter as essentially Tonic. In this way, I doubt not, very many articles have acquired the unmerited reputation of being Tonic. I have very often known Extract of Aloë prescribed as a Tonic ; and though I have often inquired for the ground on which it is so reckoned, I never yet obtained any other reason, than the mere fact that it is bitter.

I have often had occasion to prescribe it in small doses to be taken continuously and some times protractedly ; but I never saw any thing like Tonic effects from it. I have very often known the roots of the American Apocyna prescribed as Tonics, though they are not only destitute of all Tonic power, but are positively exhausting. I believe even that most bitter articles, that possess some other power, are usually incapable of producing any Tonic effects ; but there are exceptions to this rule. Ignatia amara and the several Erethistic Strychni though highly active in an other way, are yet decidedly Tonic. But even when bitter articles are really Tonic, the principles in which this power resides are almost as numerous and as various as the different Tonic articles ; so that it is idle to talk and write about "the bitter principle" at the present time.

The Tonics of organic and vegetable origin, I believe may be said to depend for their activity, in all probability invariably, upon some one or more proximate principles, which may be obtained separate, pure and intirely free from any of the inert proximate principles of the crude article. Not that this has been actually demonstrated in all cases, but it has been done so often as to afford a conclusive analogy in favor of its practicability in all. I think that there is good reason to believe that the whole of

the Tonics of organic and vegetable origin depend for their activity either upon some Alcaloid, or upon some Oxyd of a compound radical of H. C. The great class of Tonics is by far too numerous to have had every individual of them subjected to a regular analysis, and therefore I judge of those that have not been analyzed by analogy from those that have. So far as analyses have been made, they justify the above generalization. Now it is not infrequently the fact that different individual articles, if they are very nearly allied botanically, contain the same active principle. Judging by all the articles with which I am acquainted, I should think that the small natural order Simarubaceæ might contain only a single active principle. Judging in the same way, I should think that all the Gentianaceæ used in medicine could contain only a single active principle. On the other hand the Febrifuge bitter Tonics not infrequently contain a plurality of active principles, some times in the same individual article. Cinchonine and Quinine (commonly so called) are often found associated in one and the same article; and several other Alcaloids are found either in the Cinchonæ, the Cinchoneæ, or the Cinchonaceæ, that are commonly reputed to belong to this same group of Tonics. When any vegetable proximate principle has once been obtained, investigated and ascertained to be Tonic, there can never be any hesitation in ascribing its powers to any vegetable article that contains a notable and predominating quantity of such principle, as ascertained by chemistry merely.

The Tonics of inorganic or chymical origin, unlike those of organic and vegetable or animal origin, mostly depend for their activity, not upon any particular proximate principle, but upon the compound as a whole. There are some exceptions to this however. The Cyanid of Hydrogen (or as some would call it, Cyano-hydric Acid) depends solely upon the Cyanogen which it contains, as a proximate principle, for its medicinal activity as a Narcotic, and not at all upon its other proximate principle, nor upon the whole as a Compound. Now there are Tonics whose active principle is in perfect analogy with this. Indeed there are a number that are supposed to contain this compound, though I think incorrectly; but this is not supposed to be their Tonic principle. The Disoxy-ferrite of the Sesquicyanid of Iron is commonly reckoned Tonic, by virtue of the six equivalents of Iron which each equivalent

of the Salt contains. But it contains six equivalents of Cyanogen also, as well as three equivalents of Oxygen. Now the Cyanogen is so active as not to allow the patient to take a sufficient quantity of the Salt to obtain any effects from the Iron, even admitting that this last article really possesses a Tonic power. There are Chlorids, Bromids and Iodids which depend for their activity intirely upon the Chlorine, Bromine and Iodine which they contain, and not at all upon the other principle, nor on the compound as a whole. It is believed that their Tonic principles are in analogy with these; as for example, the following. The dose of a compound of Arsenic, whether it is simple or complex, may be determined with sufficient precision, by determining the proportion of the elementary Arsenic which it contains.

There are some Tonic medicines which are compounds of organic and inorganic principles, such as Protiodid of Quininum, Dicyanoferrite of Cyanid of Quininum, etc. In such compounds there are often two or more powers, each power depending upon a different principle entering into the composition of the compound. Where medicinal activity depends upon a proximate or ultimate principle of a compound, and not upon the compound as a whole, we may generally calculate the appropriate dose of the compound with all necessary accuracy, if we know that of the principle, whether proximate or ultimate, on which its activity depends. The dose as a Tonic of such a compound as Protiodid of Quininum may be easily calculated by determining the proportion of the Quininum which enters into its composition; and likewise its dose as an Adenagic may be calculated by determining the proportion of Iodine. The dose of the Dicyanoferrite of the Cyanid of Quininum as a Tonic may be determined by calculating the proportion of Quininum that enters into its composition; and its dose as a Narcotic, by calculating the proportion of Cyanogen. I do not reckon the small proportion of Iron which it contains as any thing medicinally. By the aid of chemistry, we may infer with all reasonable certainty that the Iodoquininate of Iodid of Potassium is of much less value as a Tonic (if in reality it is of any value at all) than if it did not contain one equivalent of Potassium, an element, whose compounds are very active exhausting agents, and even true Antiphlogistics.

The two equivalents of Iodine which enter into the composition

of this compound, are much more likely to coincide in their effect with the Potassium, than to counteract it. At all events, the exhausting effect of the equivalent of Potassium is too much for the Tonic effect of the equivalents of the Quininum.

I am acquainted with physicians much in the habit of prescribing the Tartrate of Potassa and Sesquoxyd of Iron as a Tonic; but it is easy to perceive a priori, that an equivalent of Potassa and an equivalent of Tartaric Acid, both active Antiphlogistics, must more than countervail the feeble Tonic power of an equivalent of Iron, an article so feeble that it has even been a question whether it possesses any power at all. This any man may know experimentally, who will carefully observe the operation and effects of this Salt taken continuously and protractedly by itself. He may likewise know it experimentally, if he will carefully observe the efficient exhausting effect of the Bitartrate of Potassa taken continuously and protractedly by itself; and will compare it with the observation of the feeble, and in fact doubtful, Tonic effect of Iron, likewise taken continuously and protractedly by itself. The delusion of the supposed Tonic effects of the Salt under consideration, can be kept-up with those who prescribe it, only by accompanying it, in large proportions, with efficient bitter Tonics, Tincture of Cantharis, Wine, Alcohol, etc. This is the only way in which I have ever known any physician continue its use as a Tonic. All this is founded upon laws that have been stated in the preceding part of this work.

The Tonics are indicated mainly in chronic diseases of exhaustion, and in nearly all of this character. The group of Tonics, the primary manifestations of whose operation is in the organs of primary digestion, appear to me to be of no service in any acute atonic disease before its crisis, except barely for a trifling increase of appetite and improvement of the condition of the stomach. The very fact that an acute atonic febrile disease is pending, in all ordinary cases, necessarily precludes much appetite. After the final crisis, if the appetite should not happen to return, which is some times the case, this set of Tonics may be used with great advantage. In Intermittent, this group is just about worthless. Not but that a few trifling cases may occasionally be arrested by a large amount of them; but they exert little or no influence over intense cases. I think we may say in general terms, that this

group of Tonics is more especially adapted to those cases in which the exhaustion is primarily seated in the stomach and upper and smaller intestines, and where the morbid conditions consist mainly in deficiency of appetite and digestive power, and when the exhaustion of the system at large depends upon deficiency of nutrition. We may also say in general terms that when the exhaustion is primarily seated in the nervous or sanguiferous system, and the organs of primary digestion are only involved secondarily, the simple bitter Tonics are of comparatively little value.

That group of Tonics the primary manifestations of whose operation are in the nervous system generally, are capable of rendering more or less service in those cases of acute atonic febrile diseases in which there is considerable disturbance of the nervous system, such as Subsultus, Singultus, tendency to Coma, etc. but I doubt not that they benefit as much by another power which they possess, as by their Tonic power. I believe that this group is utterly incapable of curing any intense cases of Intermittent.

That group of Tonics commonly called Febrifuge, the primary manifestations of whose operation are in the sanguiferous system, are also indicated in acute atonic febrile diseases, whether Pyretica, Phlogotica or Exanthematica. These are the only important remedies at present known for Intermittent.

When exhaustion is accompanied with very considerable morbid irritability or morbid sensibility or both, the more active Tonics, as well as Antisbestics, in ordinary doses and quantities, some times disagree, producing morbid irritation, occasionally morbid sensation or both, either in the degree constituting considerable and troublesome uneasiness and restlessness, or even amounting to more or less pain. This is commonly considered as contraindicating this class of remedies; but very incorrectly. I have very often obviated the difficulty in question by much larger doses or much larger quantities of the most appropriate Tonics, such doses and quantities as will make a sufficiently strong impression at once, and immediately counteract and overcome the morbid irritability and morbid sensibility in question. Such doses and such quantities in general accomplish the purpose at once. But there is another method of effecting the same object, which is more convenient, at least it would be so esteemed by some. This is by a proper use of some suitable Narcotics, either by way

of preparation for the Tonic, or in conjunction with it, or both. Of the whole class of Narcotics, none is better for this purpose, than some preparation of Papaver, since this is one of the best articles of this class for the purpose of an Antirritant. An inadequate quantity of the most appropriate remedy will seemingly very much aggravate Intermittent in this way. I have repeatedly been called in consultation, for a case of Intermittent, to all appearance aggravated, by doses and quantities of medicine of which a considerably greater amount would have arrested the disease at once. Under such circumstances, I have known the physician in attendance to abstract the appropriate medicine, and employ Saline Cathartics and Antimonials for a time. Then he would give a still less adequate quantity of the appropriate article. This would again seem to aggravate, when he would again abandon it and again give the Cathartics and the Antimonials. When I have advised a considerably larger quantity of the appropriate article, the physician in attendance has answered, "I should not dare to give any more;" and yet a few much larger doses have always agreed perfectly, and immediately arrested the disease, and without the least inconvenience. In these cases just described, the addition of a sufficient amount of Papaver to the appropriate remedy, will prevent the seeming aggravation from the inadequate quantity; and if the case is not very intense, will often, by its conjunction, effect a cure.

Many physicians suppose that Tonics are inadmissible in diseases of the lungs. I have known the whole body of the profession in a particular limited section of the country, to entertain such opinions; and as is usually the case even with more unfounded prejudices, this opinion had been so industriously propagated and inculcated among non-medical people, that not a single person could be found, who did not experience exceedingly bad effects, if with his own knowledge, Tonics were administered during any pulmonary disease, either chronic or acute. But why should Tonics be any more contraindicated in diseases of the lungs, than in diseases of any other viscus, or indeed than in diseases of any other particular organ or part? The lungs are an emunctory of the system. They excrete the effete Carbon which can pass-off only in the form of a gas; and the excretion of gas requires rather a peculiar apparatus. In addition to this, they excrete latent heat and perform the function

of a bellows to that curious organ of expression the larynx. These are all the functions of the lungs. Now there is nothing in these functions to preclude invigoration, or the use of invigorating agents. I have often inquired of those who considered Tonics as not admissible in diseases of the lungs, why they deemed such to be the fact, but I never met with a person who had an answer ready. I was professionally educated among a body of physicians, who employed Tonics in diseases of the lungs, as much as in diseases of any other viscus or organ, when there were proper indications for them. I was therefore in the habit of seeing Tonics employed during my whole professional pupillage, as much in pulmonary diseases as in any other; and I have also been in the habit of employing them myself in the same cases and manner. I have very often seen great benefit from a free use of Cinchona in Pneumonitis Typhodes-nosta, or that Inflammation of the lungs, in which the topical affection is confined to the bronchial membrane, and is of the same specific nature as the topical affection of the mucous membrane of the upper and smaller intestines in Dysentery, the constitutional febrile affection being Typhus nervosus. In Pneumonitis Typhodes-Erethematica (the topical Phlogosis being a true Erythema confined to the bronchial membrane, and the constitutional febrile affection being a Typhus putridus, of some grade or degree, Cinchona is absolutely indispensable. There would be no substitute for it.

The nature and character of the power of the Tonics, and their uses and applications, together with the proper conjunction of them with other remedies, and the previous preparation of the system, that is often required for their best operation, is, on the whole, better understood, and better treated-of in books, and better practised by physicians in general, than the same things in reference to any other class of remedies. The discoveries and improvements that are made from time to time, have respect principally to the introduction of new and different articles, rather than to the application of the old ones, and may very properly be referred to the histories of the individual articles.

PROËM TO THE CLASS STYPTICA.

The term Styptica is ancient and classical Greek. It is an attribute derived from a Greek verb signifying *astringo* (and if I may be allowed to use a very unusual word in English) to *astringe*. Styptica is commonly explained in the most common Greek Lexica, by the Latin term *astrectoria*. The term *Stypsis* is also ancient and classical Greek, is derived from the same Greek verb, and signifies the effects of an astringent.

Definition.—Styptica or Styptics are articles which produce a vital contraction and condensation of the soft solids, together with increased absorption, and diminished excretion and secretion, particularly in diseased parts. Indirectly Styptics moderately diminish morbid irritability and irritation, and morbid sensibility and sensation.

From the ordinary definitions and the accompanying remarks of authors, I should judge that most of them, if not all, consider a Styptic operation as either mechanical or chymical or both in conjunction. My views differ widely from this. If they are not intelligible from my brief definitions, I hope they will be so from what follows.

Cullen defines Astringents to be "such substances as, applied to the human body, produce contraction and condensation of the soft solids, and thereby increase their density and cohesion." John Murray adds to Cullen's definition "by the operation of this corrugating power, either directly excited on a part, or extended by sympathetic action, the morbid affections arising from a state of relaxation, are supposed to be removed." This appears to me to be a purely mechanical explanation, and if so, can not be correct, in application to the living body. It probably originated from the effects of Tannic Acid (the Styptic principle of all organic vegetable substances) upon dead animal matter; but it is now well known not to be the whole of the operation that takes place, even upon dead substances. I can not but think that both Cullen and Murray, in their explanations of the operation of the Styptics, derived their notions rather from the chymical process of tanning than from the vital process of the operation of a medicine. At the present day, I suppose that no one will pretend to maintain that what is now intended by tone, and much

less entony or phlogistic diathesis, is in any way connected with a mechanical tension of the fibres of the animal machine; or that atony, or general exhaustion (which is by no means identical with atony) results from a preternatural mechanical relaxation of them. I think I may say, without fear of contradiction, that each of these states is now well known to depend upon the condition of the vital power of the solids generally, rather than upon the mechanical condition of the fibres. Now a mechanical explanation of the operation of the Styptics is no more true than a mechanical explanation of the operation of the Tonics. But though Styptics do not mechanically increase the tension of the fibres, yet I insert (in the words of my definition) that they produce "a vital contraction and condensation of the soft solids" generally, certainly not by any "corrugating power, either directly exerted on a part, or extended by sympathetic action." This vital contraction is probably of more or less service in the restraint of atonic Hemorrhages and in the atonic Profluvia from the mucous membranes; though in the latter case, the power of the Styptics for diminishing excretory action and increasing absorbent action is the more important part of their effects. That the contraction and condensation in question is not chymical nor mechanical, as in tanning a dead skin, but truly vital, is sufficiently evinced by the fact that it may often be produced as perfectly by the simple and pure Oresthetics, such as several species of Capsicum, Amomum Granum Paradisi, etc. as by the Styptics—indeed, in some cases, more perfectly and more speedily.

I think we may reckon Tannic (Stryphnic, Scytodepsic, Scytodephic, Byrsodepsic or Byrsodephic) Acid as the sole principle of Stypticity in all organic vegetable Styptics. This would justify a full consideration, not only of the pharmacological, but of the chymical habitudes and relations of Tannic Acid in this proëm, and accordingly as an instructor in a public institution, I have always hitherto been in the habit of treating of this substance in this manner; but at present I shall omit doing this. But as treating of Tannic Acid pharmacologically or medicinally or therapeutically is tantamount to treating of the organic vegetable Styptics, I shall some times write respecting Tannic Acid specifically, when I mean equally all of the vegetable group.

A pure Styptic power is commonly reckoned as intrinsically as

invigorating and Tonic power. But I consider that I have ascertained, with absolute certainty, by numerous and repeated trials, that a free and continuous use of Tannic Acid (the sole Styptic principle of vegetables) is exceedingly liable, sooner or later, to produce disorder of the stomach. First, it diminishes appetite and digestive power. Second, it occasions food of almost all sorts, and various medicines, to produce a sensation of weight and load in the stomach, soon after they are swallowed. Third, sooner or later, it produces this sensation intirely independent of food or other medicine. Fourth, it produces morbid irritability of the gastric par-vagum, and occasions frequent and augmented upward peristaltic action of the stomach. These effects are produced more speedily and more intensely in some subjects than in others; but I have known no case, in which they have not taken place sooner or later, and in a greater or less degree, provided the use of the Tannic Acid was persevered-in, for any considerable time, and in any quantity that could be considered as at all efficient. In some subjects all of these effects have taken place in a comparatively short time, in a comparatively intense degree, and from comparatively small quantities. All of these effects, though occurring in conjunction with the regular effects of a true Styptic, seem to be distinct and separate effects. At all events they are effects that are often produced by agents intirely destitute of any degree of Styptic power. By virtue then of what power is it, that Tannic Acid operates in the manner just described? The effects in question are certainly produced by all the Antiphlogistics when they are used in sufficient quantity, and for a sufficient length of time, in non-phlogistic, and much more, in positively atonic diseases. Indeed I have long been convinced that they are regular and even characteristic effects of all the true Antiphlogistics. This inevitably brings us to the conclusion that Tannic Acid is more or less Antiphlogistic;—an opinion quite opposite to that which is commonly entertained by the medical profession at large, as in regard to the powers and operations of crude Styptic vegetables, which are almost always, if not invariably considered, as Tonics, as well as Styptics. It is frequently the fact that in crude articles, a bitter Tonic principle accompanies Tannic Acid, and predominates over it so much that the article is an efficient Tonic, in defiance of its Tannic Acid. This is the fact with the common crude

barks of Cinchona, which contain a sufficient amount of the Styptic principle to render them efficient as respects this operation, and as I presume, sufficient of the Styptic principle to subtract some what from their Tonic power. If any of the crude Styptic vegetables do ever in fact, prove truly Tonic, as appears to me, it must be by virtue of some bitter Tonic principle which they contain in conjunction with their Tannic Acid, and certainly not by virtue of their Tannic Acid. So far as the production of their Styptic effect is concerned, no crude Styptic vegetable is worthy of being used in medicine in comparison with Tannic Acid; but if pure Tannic Acid produces exhaustion, primarily of the stomach, and secondarily of the system at large, and crude Styptic vegetables, by means of possessing a bitter Tonic principle, produce no such effect, this is certainly a ground for the preference of crude Styptic vegetables, when their use is to be continued for a considerable time.

Previous to my use of Tannic Acid in a state of purity, I can not say that I ever observed any Antiphlogistic (or direct exhausting effects) from any of the ordinary preparations of crude Styptic vegetables, except perhaps of the root of *Statice Caroliniana*; and even the effect in this way, that this article is liable to produce, when used freely, and for any considerable time, I used to ascribe to its very disagreeable and very nauseous flavor. I am now however much inclined to think that this article is more destitute of any bitter Tonic principle, while at the same time it is more intensely and purely Styptic than any other crude Styptic vegetable in common use in the *materia medica*, and therefore that it does actually produce the direct exhausting or Antiphlogistic effect of pure Tannic Acid, in a greater or less degree.

It is true that it might have been inferred by fair analogy, from the composition of Tannic Acid, viz. $H. C. + O.$ that it ought to possess a greater or less degree of Antiphlogistic power, as do other vegetable Acids (at least all whose powers have been investigated) that have the same composition. Would not the regular and uniform conjunction either of the Disulphate of Oxyd of Quininum or the Salicate of Oxyd of Salicinum (as circumstances may give rise to a preference of one or the other) with Tannic Acid, when ever it is employed, enable us to avail ourselves of the superior intensity of Tannic Acid, as a Styptic, over the crude

Styptic vegetables; while at the same time, it enables us to avoid the exhausting effects of Tannic Acid in the Stomach? I am by no means sure that it would. I do not believe that all the Disulphate of Oxyd of Quininum, or all the Alcohol that a patient can use, would countervail the injurious effects of Tartrate of Antimonia and Potassa or Nitrate of Potassa in efficient quantities, in an intense atonic disease; and vice versa, I do not believe that all the Tartrate of Antimonia and Potassa, and all the Nitrate of Potassa, that a patient could well take, would be capable of countervailing the injurious effects of Disulphate of Oxyd of Quininum or of Alcohol, in a decidedly phlogistic disease.

In the crude Styptic vegetables, it is quite possible that the Tannic Acid may be so proportioned to the bitter Tonic principle, as just to prevent the exhausting effect of the Tannic Acid. However, I do not know that this is the fact, and I would not by any means have it taken for granted, without investigation. Those who viewed the Styptics as essentially Tonics, formerly objected to the substitution of the Alcaloids Cinchonine, Quinine, etc. and the Salts of the Oxyd of Quininum, etc. for the crude bark, on account of the supposed loss of Tonic power resulting from the abstraction of the Tannic Acid. Even admitting that the belief in the Tonic power of this Acid had been true, there would have been much more gain, by the concentration resulting from the separation of the inert matters, than loss from the privation of the Tannic Acid. Beside this, when Cinchona is the most indicated on account of its Tonic power, a Styptic operation is either not indicated at all, or is actually contraindicated; and even when both operations are indicated at one and the same time, the desired effects may be better obtained by a conjunction of Disulphate of Oxyd of Quininum and Tannic Acid, than by the use of the crude bark of Cinchona with all its accompanying inert matter.

I do not know whether Tannic Acid possesses a sufficient degree of Antiphlogistic power, in comparison with its Styptic power, to render it useful in any acute phlogistic disease or not. Antiphlogistication consists essentially in a peculiar direct reduction or diminution of vital energy and strength of action, primarily in the circulating system, and secondarily in other parts of the system. Now it is obvious that there may be every possible grada-

tion of this power, from the most intense degree of it known, to the very smallest degree that is capable of being distinctly appreciated; and it is equally obvious that the very smallest degree of it, that is capable of being distinctly appreciated, might be of no importance in the treatment of an acute phlogistic disease, though it might be capable of doing injury, in a very atonic disease, and even in a non-atic, and, at the same time a non-phlogistic one. In addition to this, the Styptic power of Tannic Acid may possibly hinder it from benefitting an acute phlogistic disease, by virtue of its Antiphlogistic power; though I do not certainly know that it does. In fact, I do not certainly know how a pure Styptic power might affect phlogistic diathesis.

There are but few Styptics of inorganic and chymical origin; and these with a single exception, are of no great importance as Styptics, what ever they may be for their other powers. They do not depend upon any principle or principles common to the whole, which they may happen to contain, but their Stypticity depends upon each individual compound as a whole. In such a case, chemistry can be of no service towards ascertaining new and previously unknown Styptics of the same group; but there is a simpler and easier way, viz. by the taste, since a Styptic taste is always a sure indication of Styptic power. As the Styptics of chymical or inorganic origin possess no common principle of Stypticity, each must be examined separately, in reference to the effects which they produce, in addition to their Styptic operation.

The Bisulphate of Alumina and Potassa, in addition to its Styptic power is an efficient Antiphlogistic, and a Neuragic. It also possesses some degree of Cathartic power, and perhaps even, it may be reckoned as more or less Emetic. The Protacetate of Lead, in addition to its Styptic power, is efficiently Neuragic. I have never been in the habit of considering it as possessed of any Antiphlogistic power; and yet, it is extremely liable to produce a very considerable degree of exhaustion of the stomach. Unless it can be shown to produce this effect by virtue, either of its Styptic or Neuragic powers, we shall, after all be compelled to reckon it Antiphlogistic, but perhaps not of the proper quality for the relief of most phlogistic diseases. Perhaps it ought to be reckoned as Emetic.

The Protosulphate of Zinc, in addition to its Styptic power, is

Neuragic and Emetic. Some reckon it as a Tonic. Indeed I believe that this is quite a prevalent opinion, with very many physicians. However in my use of this article (and it has not been small) when ever no other unequivocal Tonic, or Antisbestic, has been conjoined with it, I have never witnessed any thing like a Tonic effect from it; although I began and even continued its use for several years, nothing doubting its true Tonic powers. My faith in its operation in this manner, it is true, was intirely founded on prevalent opinion among the physicians with whom I was in daily habits of intercourse to a greater or less extent. But time and continued observation, have long since set aside all belief in the supposed Tonic power of the Protosulphate of Zinc. In fact it is now a long period, since I have been in the habit of witnessing the fact that it impairs the tone of the stomach when used efficiently and continuously, and that alone, or without the aid either of some unequivocal Tonic or Antisbestic. But this article is decidedly less exhausting than Sulphate of Alumina and Potassa or than the Protacetate of Lead.

The Protosulphate of Copper is very decidedly Styptic. I never knew it to operate as a Tonic, as many suppose; nor on the other hand, did I ever witness any exhausting and much less any Antiphlogistic effects from it, though I have seen it given, in a few cases, at the rate of a drachm a day, so managed as not to nauseate, and continued for a considerable time. It is true that every person can not take it in such a quantity without nausea and even vomiting, though no small number may, quite contrary to what we should expect a priori.

The Protosulphate of Iron is decidedly Styptic and it is commonly reckoned as a Tonic. I can not say however that I have ever witnessed the latter effect from it, when taken intirely alone. On the other hand, I never saw any exhausting effects from it, when so managed as not to nauseate. In conjunction with simple bitters or Cinchona or Oresthetics, invigoration follows its use; but I think we may very properly question (with Dr. Jacob Bigelow of Boston) whether the invigoration is not produced exclusively by the vegetable articles with which it is accompanied.

“Cavarra, having previously ascertained, by experiments on Dogs, that pure Tannic Acid possesses no poisonous qualities, himself took three pills, each containing two grains and a half for

three successive days." "Obstinate constipation was the consequence, which lasted for eight days, and was then relieved by the taking of two drops of Oil of Tiglium." "An exactly similar effect was produced on two other healthy individuals, who took this agent in the same dose." (*Amer. Journ. Med. Sci. Phil.* 1837, No. 41, Pg. 223.) I do not think that any experiment was needed to prove that Tannic Acid is not poisonous. This had been determined long before, by the great freedom with which Styptic Extracts (very nearly pure Tannic Acid) have been administered, as for example, Extract of the bark of *Quercus tinctoria*; of the raspings of the wood of *Castanea Americana*; of the leaves of the *Spiræa tomentosa*; etc. But if this fact had not been ascertained, the fact that it did not poison a Dog would no more prove that it could not be noxious to man, than the fact that the bite of the *Uropsophus durissus* is not injurious to swine proves that it is not noxious to man. Before I met with Mr. Cavarra's communication I had repeatedly prescribed Tannic Acid, and had carefully observed its effects. But immediately on obtaining his statement, I commenced taking doses of ten grains of the pure article, repeating them four times in the twenty-four hours, and continuing them about a week, with no more constipating effect than if I had taken so much Maize meal. Subsequently a similar trial of this agent was made by several of my professional pupils, and with no more effect as respects the intestinal discharges, than upon myself. The article nauseated a little however, and impaired the appetite considerably. It must be observed that we were all in health at the time of these experiments. I have often administered Tannic Acid in doses of a heaped teaspoonful, at short intervals, till it begun to disturb the stomach, in cases of Hemorrhage from the lungs for example, and without any sequelar constipation. I think therefore, that no body need fear obliteration of the alimentary canal by Tannic Acid, even if he should take two grains and a half a day for more than three successive days, especially in a case of Diarrhœa. For my own part, since Chronic Diarrhœa has been so prevalent, I have often wished to find subjects as susceptible of the constipating effects of this article as Mr. Cavarra; but I never expect to be so fortunate.

Cavarra next says "it now remained to determine, if possible, in what way Tannic Acid produces so powerful an effect on the

mucous membrane of the intestinal canal." "A Dog, in which the maximum of constipation had been occasioned, by giving large doses of Tannic Acid was killed." "The intestinal mucous membrane was found to be dry." "The fecal matter was extremely hard, and, as it were, adherent to the sides of the colon." "On examining the surface of the mucous membrane of that part, with a strong magnifier, the villosity, and the pores were found considerably contracted." "From these and several other experiments, it is concluded that Tannic Acid acts chimically on the intestinal mucous surface, in the same way that it acts on the" (dead) "skin of an animal, and that it produces constipation by the constriction which it causes in the secreting parts or tissues." (*Ibid- em Pg. 224.*)

I must confess, I can not believe that the operation of Tannic Acid is ever of this character. I have repeatedly witnessed post obit examinations, in cases where a large amount of this agent had been taken, and that, for a considerable time, in Chronic Hemorrhage, Chronic Diarrhœa, Chronic Mucous Profluvia, etc. and also in Typhus nervosus accompanied with Diarrhœa, as well as in Dysentery, and I never witnessed any such constipation, or any thing in the least approximating to such a condition of the mucous membrane of the intestines as is here described; and none of my professional associates, who have used this agent as I have, ever saw any thing like it, any more than myself. I can not therefore refrain from entering my protest against deducing pathology, pharmacology and therapeutics for the human system from loose and vague experiments upon Dogs or any other brute animals, of equally remote affinities to man. Doubtless much, if not all, that was witnessed in the intestinal mucous membrane of the Dog, took place after the death of the animal, by means of the operation of the Tannic Acid remaining in the alimentary canal, when he was killed for examination. True physiology, pathology and therapeutics are neither mechanics nor chemistry; but they are vital actions, taking place under laws widely different from those of the first two departments of nature.

Again Cavarra says that "the superiority of pure Tannic Acid over such substances as contain it in greater or less quantity, is incontestible." "Its relative power is much superior; but experience alone could decide whether pure Tannic Acid possessed

any medicinal properties or not." It is experience (experiment) only, that determines whether any agent possesses medicinal powers or not; but if impure Tannic Acid is perfectly well ascertained to be medicinally active, I hold it to have been absolutely certain that the pure article must have been so, without any trial of it. "The first experiment which the author made, was on a lady, who was affected with Diarrhœa of an obstinate nature, for sixteen months." "Every kind of treatment, including astringents, had been tried without success." "After the administration of five pills, each containing a quarter of a grain, the Diarrhœa completely disappeared, and, in addition, the lady found herself cured of a Leucorrhœa, with which she had been affected, for the last eighteen years." "It is now a year since this lady has been cured, and she continues to enjoy perfect health." (*Ibidem.*)

Mr. Cavarra would seem to consider himself as the first investigator of this article as a medicine; but if so this is an error. I have personal knowledge of its having been fairly tried, several years ago; and I doubt whether that was the first time. It is by no means so new a medicine as some appear to suppose. But Mr. Cavarra's success with this agent in Diarrhœa, altogether surpasses my own, or that of any other of my professional acquaintance. I was never so fortunate as to arrest a case of Diarrhœa with this article, since I first had knowledge of it, though I have administered it in small doses and large, at short intervals and long, and have employed it both perseveringly and transiently, and in a considerable number of cases. The most that I can say is that I have known it aid in a cure. Mr. Cavarra must have had some rather singular cases, if they resisted absolutely every other sort of treatment, including crude Styptics and the numerous Styptic Extracts, which are almost pure Tannic Acid, and then yielded to a grain and a quarter of this substance intirely pure. In any of these cases, that resisted all treatment, except a grain and a quarter of Tannic Acid, did he ever employ Opium in uniform doses, at regular and short intervals, rapidly increased till the Diarrhœa was restrained, or till its operative effects forbade any further augmentation, the intervals between the doses being shortened as the quantity of the medicine taken during the twenty-four hours was enlarged? If some such method as this had not been tried in Mr. Cavarra's reported case, I should not be willing to

admit that "every kind of treatment had been tried without success." I think I could mention some other valuable methods, that (as appears to me) could not possibly have failed in a case curable by a grain and a quarter of Tannic Acid. I make comments upon this case, because I deem it important that undue confidence should not be reposed in any medicine of real value, as Tannic Acid undoubtedly is.

It is my belief that this article is of much more utility in the Mucous Profluvia, i. e. the several species of *Blennorrhœa*, and also in the *Hæmorrhagiæ*, than in *Diarrhœa* of any variety either chronic or acute. Cavarra precedes and states that "this first experiment proves that Tannic Acid acts not only on the mucous membrane with which it comes into contact, but also exercises a marked influence on all the mucous membranes of the body." "Other cases soon confirmed this conclusion." "Thus a young woman, who was affected with Chronic-pulmonary Catarrh" (probably *Blennorrhœa bronchialis* is intended) "and was cured with six grains administered in the dose of a quarter of a grain a day." "It would be impossible to give an account of all the cases of *Diarrhœa*, Catarrh" (*Blennorrhœa* probably) "etc. which have been cured, under the hands of the author, by the use of Tannic Acid." "We shall therefore content ourselves, with simply transcribing the conclusions, to which the experiments of Cavarra, with this new medicinal agent, have conducted him." (*Ibidem.*) This is only what has been ascertained of all Styptics in common use, and it has probably been observed hundreds of times of certain Styptic Extracts, which were so nearly pure Tannic Acid, as to be sold as such, though they were dark colored; and so nearly pure Tannic Acid that their dose, and the quantity required for the production of a given effect was not appreciably different; only I can find nobody that accomplishes any thing with such exceedingly small doses and quantities in the twenty-four hours. "First." "Pure Tannic Acid, by producing a degree of impermeability of the mucous membrane, and also by its action on the nervous system, cures *Diarrhœa*, and Chronic Catarrh." (i. e. *Blennorrhœa nasalis* and *bronchialis*) "Second." "Its efficacy in *Hæmoptysis*, Uterine Hemorrhage, and *Gonorrhœa*, is also well demonstrated." "The author reports having cured two old cases of Clap, one of fifteen, the other of twenty years' standing." (*Ibidem.*)

The notion that Tannic Acid produces a mechanical impermeability of the mucous membranes appears to me to be a mere chimera. While alive they are always vitally impermeable. These membranes contain minute glandular structures, by which they secrete air, and the various vitiated fluids that are found in the alimentary canal in numerous diseases. Nothing but a direct and great diminution of the secretory activity of these glandular structures, and a change in the quality of their vitiated action, will restore a healthy state. It does not require mechanical permeability or impermeability to constitute a natural and healthy state of these functions. What has permeability or impermeability to do with excessive and vitiated secretions, or their restoration to a natural and healthy state? When will physicians cease from such absurd and useless hypotheses, so utterly destitute of all evidence?

"Tannic Acid may be given in the form of Pill, or as a Draught, or in Enema, and in a dose from a quarter of a grain to two grains, without producing any unpleasant Constipation; but its effects must be observed with care." (*Ibidem.*) Upon an emergency, as copious internal Hemorrhage for example, much larger doses of this article must be administered, and at short intervals. In such a case, it may be taken hastily stirred into water made quite sweet with sugar, or it may be taken mingled with syrup of sugar, if that preparation happens to be at hand.

Many—probably most medical authors and practitioners—entertain a vague idea that a Styptic or Astringent operation is the opposite—the very antipodes—of a Cathartic operation; and of course they consider the two as incompatible—as operations that can not be possessed by one individual article; and that can not possibly be indicated at one and the same time. This opinion however appears to have very little foundation. A pure and simple Cathartic operates first to increase and render far more watery the excretion from the mucous follicles of the lining membrane of the upper and smaller intestines; and second, to increase the activity of the involuntary muscles, upon which the peristaltic action of the whole alimentary canal depends. A Styptic undoubtedly has more or less tendency to diminish the excretion from the mucous follicles, but no tendency at all to diminish increased peristaltic action—quite an important part of a Cathartic operation,

and of Diarrhœa. Hence doubtless the very trifling efficacy of Tannic Acid in Diarrhœa. So far and no farther (as appear to me) the Styptics and Cathartics are opposed to each other.

But there is an alleged fact in regard to the Styptics that is worthy of consideration in this place. I believe it may be considered as certain, that most if not all the crude Styptics or Astringents are actually Cathartics, if accumulated in a certain quantity, within a short time, in the alimentary canal. This I have verified in regard to a considerable number of them, but of course not by any means of the whole. I have very often seen a free use of Decoctions of the crude vegetable Styptics or Astringents that are in the most common use in New England, prove actively Cathartic, i. e. the *Statice Caroliniana*, the *Geranium maculatum*, etc. Every practitioner of medicine very well knows (or at all events ought to know) that the Infusions of the officinal species of *Cinchona*, if made sufficiently strong, and taken with sufficient freedom, will inevitably purge, unless some peculiar circumstances of the disease happen to exist, which are capable of counteracting this effect. Now I am not aware that either Quinine or Cinchonine possesses even the smallest degree of Cathartic power. At all events, I have seen their Sulphates administered in much greater quantities and for many more days in succession, than could possibly be tolerated in the form of Infusion of an equal strength of either of the officinal species of *Cinchona*, and without the least tendency to Catharsis. If these then are not the principles of *Cinchona* that cause its Infusion to prove Cathartic, this effect must be occasioned by the Tannic Acid which is contained in such infusion, since nothing else remains in it at all capable of exerting such a power.

As respects the Styptics or Astringents of chymical origin, I have to add that for many years I have been in the habit of using the Bisulphate of Alumina and Potassa (which appears to be the most intensely Styptic of them all) as an occasional Cathartic, in certain peculiar cases of disease; and I do not now recollect ever being disappointed of a Cathartic operation, whatever I may have been, as respects remedial effects. The Protacetate and Protosulphate of Zinc; and the Protacetate and Protosulphate of Copper are both notoriously Cathartic, when a considerable quantity is taken in the course of the twenty-four hours.

As respects the Protosulphate of Iron, when employing it in Dyspepsia attended with Costiveness, I have always found that by varying the quantity taken in the twenty-four hours, I could not only obviate the Costiveness at pleasure, but even produce moderate Catharsis; so that this agent is not an exception, in this respect, to the chymical articles possessing Stypticity. I never knew the Protacetate of Lead (the most intense Styptic of inorganic and chymical origin with the exception perhaps of the Bisulphate of Alumina and Potassa) to operate as a Cathartic, though I have repeatedly known a lax state of the intestines to follow its rather protracted use. I have always supposed that its intense Neuragic power prevented its immediate Cathartic operation, an effect which this power produces in some other cases. But it is difficult to obtain absolute proof upon the subject, and I can not pretend to have done it.

The Styptics are undoubtedly far more effectual in the several Blennorrhææ, as B. nasalis; B. faucialis; B. bronchialis; B. intestinalis; B. vaginalis; B. urethralis; in all of which, there is little beside increased secretory activity and exhaustion, the latter of which, it is true, the Styptics have no power of obviating, or even of contributing to obviate. Again, in Hemorrhages from the mucous membranes, in which Styptics are the next most efficacious, the blood effused undoubtedly passes through the excretories, since it has every appearance of sweating-out, as it were, from innumerable minute points. Hemorrhages from larger secretory apparatus, as from the uterus, the kidneys and the liver, are far less under the control of the Styptics; but still, even in these, they will accomplish something, more in uterine than in renal or hepatic Hemorrhage.

"The effect called Astringency" (says a highly distinguished author) "considered as distinguishable by the taste, is incapable of being defined." "It is perceived in Green Tea, in the Husks of Walnuts," (*Juglans regia* and) "of Nuts" (generally) "and eminently in the Nutgall." Our author supposes that the reason why an Astringent or Styptic taste can not be defined "is probably owing to the circumstance that the Acids have likewise the property of corrugating the fibres of the mouth and tongue, which" (therefore can not be) "considered as characteristic of Astringency as relates to taste; and hence" (he says) "the Gallic Acid, which

is commonly found united with the Astringent principle, was long mistaken for it." "Seguin" (says our author) "first distinguished them; and from the use of the latter in tanning skins" (he) "gave it the name of" (Tannina or) "Tannin." (*Vide Ure's Nicholson's Dictionary of Chemistry, Article Astringent Principle.*) To me it is not clear what our author here means, but I suppose it is that we can not define nor specify the effects of a Styptic, though we readily distinguish one by the taste. Perhaps such a statement may be true; though I can not but believe that it is not. I can not but think that I have succeeded in specifying the principal—the most important operative effects of this power; but perhaps I deceive myself. Though we always distinguish a Styptic so readily by the taste, yet perhaps it may not be practicable to describe this taste in such a manner that it may be identified by the description; still with proper attention, it appears to me that there can be no difficulty in ascertaining when an article is really Styptic. It has been commonly supposed that the production of a dark color with the Salts of Iron is a sure test of Stypticity; but this is an error. There are two vegetable proximate principles that will do this; and yet, only one of them confers the power of Stypticity. These two principles are Tannic and Gallic Acids. It should be distinctly understood that the presence of Gallic Acid, without being accompanied with Tannic Acid, does not confer the power of a Styptic; and yet both of these produce a dark color with Salts of Iron, which, at one time was considered an absolute test of Stypticity. This error introduced into the materia medica a number of utterly worthless articles, which are still retained and employed, although they produce absolutely no medicinal effects. An example of one of these is *Hæmatoxylon Campeachianum*, which contains no Tannic Acid, has no Stypticity to the taste, and when given alone and by itself, produces no effect, so far as I could ever discover. I suppose that it must have been the principle now called *Hæmatoxyline* (believed to contain Nitrogen, and if so, an Alcaloid) which gave it the character of a Styptic, though incorrectly. The color produced by these two principles with Iron, is said to vary both in hue and shade, and to such a degree, as, with a practised chimist, will serve to distinguish the articles which contain one or the other; but the proportion of physicians, who ever take the trouble to

learn how to avail themselves of this test is suspected to be small. With most of the profession the taste is a far better guide; but even this requires a certain degree of education to answer the purpose. But I have been acquainted with medical gentlemen who were unacquainted with the Styptic taste.

It is said that Tannin or Tannic Acid is usually, but not invariably accompanied in vegetables, by Gallic Acid. For my part, I should think that the former would invariably be accompanied by the latter, because Tannic Acid is convertible into Gallic Acid. We are told that the common Extract of the Acacia Catechu of the shops, contains no Gallic Acid but is principally Tannin or Tannic Acid. It is most likely that this is true of it, in its perfectly dry state; but I suspect that when it is dissolved, and perhaps when it is merely moistened, some of its Tannic Acid is gradually converted into Gallic Acid. "According to Cadet," (says Lindley,) (*Introd. Nat. Syst. Bot. N. Y. 1831, Pg. 143*) "the root" (of *Krameria triandra*) "contains Gallic Acid, but no Tannic; (and yet says Lindley) "it is remarkable for its excessive Astringent qualities." This is undoubtedly an erroneous statement, the reverse being very nearly the true fact; unless this article contains a new and hitherto unknown Styptic principle, which is not at all probable, because if such were the fact, it would have been detected and recognized before this time. "Cytinus Hypocystis," (says Lindley) "contains Gallic Acid, according to Pelletier," (and) "although it does not contain Tannin," (yet) "it has the singular property of precipitating Gelatine." (*Ibidem, Pg. 73 Cytinaceæ.*) This again, is undoubtedly an error. In all probability, this article in its dry state, contains Tannic and no Gallic Acid. The very fact that it contains a principle which combines with Gelatine and forms an insoluble compound, is conclusive in favor of its containing Tannic Acid, since nothing else is known, which affects Gelatine in this manner. As commonly obtained from different vegetables, different specimens of Tannin or Tannic Acid differ in some respects; but never the less, all its varieties are essentially the same substance. As Gallic Acid exists in living organic vegetable substances as a primary proximate principle, and not merely in the dead plant as a modification of Tannic Acid, or any thing else, I should expect a priori that there would be articles containing the former, without any association

of the latter with it. Now the physician is to beware that he does not mistake such articles for Styptics. It may probably be said that Gelatine is the true chymical test of Tannic Acid, since with that substance it enters into combination, forming an insoluble compound which, of course, is immediately precipitated. With solution of Protosulphate of Iron, it is said that pure Tannic Acid produces only a drab, or at most an olive-brown color, and not a black; but as Tannic Acid in a dead and moist plant is convertible into Gallic Acid, I should think it must be difficult to find the former unassociated with the latter. I suppose that the best test of the Gallic Acid must be the Protosulphate of Iron, with which in solution, it produces a black color. Gallic Acid is not Styptic, and of course, it has no Styptic taste, and therefore can by no possibility impart Stypticity to any vegetable article which contains it.

It is generally supposed that the Styptics are of little or no service in acute diseases, or at all events, in the early stages not only of acute, but also of chronic diseases. The reason formerly assigned for this, and some times insisted-on, even at the present day, is the supposed presence of a certain amount of entonic or phlogistic diathesis, which by some, is believed to belong essentially to the first stage of true Typhus, and even most chronic diseases. This, as was supposed, contraindicated Styptics, and must necessarily be removed either by Antiphlogistic evacuations or non-evacuant Antiphlogistics, before Styptics can be expected to render any service, or even administered with complete impunity. Now in reality, there is nothing like entonic or phlogistic diathesis in any of these cases, in any stage of the maladies; so, of course, this may be considered as having no connexion with the matter.

A writer in an American medical journal discourses in this wise upon the subject. "In Diarrhœa," (says this author) "an Astringent property so called diminishes the flow of those acrid fluids into the intestines, by which their peristaltic motions are preternaturally increased, and it consequently represses the Diarrhœa." "A Narcotic, under similar circumstances, might not repress the flow of acrid matter, but would render the intestines less susceptible to its stimulus and would therefore produce the same apparent alleviation, though by a very different mode of op-

eration." This writer says farther, "it will be very readily perceived that the restraining influence of the Astringent is displayed in the corrugating and consequent condensing power that it exerts upon the intestinal canal; while the effect of a Narcotic in diminishing the irritability of the intestinal organs, and subsequently checking Diarrhœa, is a result peculiar to its operation in allaying the sensibility of the sentient parts of the animal economy." "By an association of these two" (classes of) "agents," (viz. Styptics and Narcotics, our author says) "the practitioner avails himself at once, of an important and decided advantage, in arresting the progress of this excessive evacuation, not only with more promptness than by the single administration of an Astringent, but with the more certainty of preventing its immediate return; for the Narcotic diminishing the quickness of the sensation of the bowels to the action of the acrid secretions, which are checked by the operative influence of the astringent agency of the Astringent, until the secretions pass-off by the rectum, greatly facilitates the effects of the latter medicinal substance, by its display of action in this way upon the sensibility." "An Astringent," (continues our author) "exhibited alone, would be calculated to check the inordinate secretions, but these secretions would be re-productive of the Diarrhœa as a consequence of their irritating operation on the bowels; hence the necessity of the combined use of the remedies of the classes to which they belong, in order to ensure the successful management of the malady, that is here selected as the subject of illustration, in order to demonstrate the nature and importance of remedial combinations." (*Zollickoffer on Euphorbia Hypericifolia. Amer. Journ. Med. Sci. Nov. 21, 1832, Pg. 23, 24.*)

Now I do not believe that there are ever any acrid secretions in the intestines, either in Diarrhœa or Dysentery; nor is the preternaturally increased peristaltic action ever connected with any irritating acrimony. Mere and pure Acrids are utterly incapable of producing increased peristaltic activity. Who ever knew Capsicum, Amomum Granum Paradisi or any other acrid, even when taken the most freely, produce either Catharsis or Diarrhœa? As I have else where said, the pathological conditions of Diarrhœa are first, a preternatural secretion of air into the upper and smaller intestines; second, a preternatural secretion of serum

into the same, both being a vitiated and augmented product of the mucous follicles; third, preternaturally increased peristaltic action; and fourth, in all probability more or less morbid irritability and morbid susceptibility of the parts which constitute the local seat of the disease. Now all that the Styptics perform in this disease is merely a direct diminution, and that only to a very moderate extent, of the two sorts of increased and vitiated secretion, so moderate as to be inappreciable, in an intense case.

Our writer mentions Narcotics in Diarrhœa, as if it were perfectly immaterial which individual of the large class should be employed. But if more than one single Narcotic exerts any uniform and reliable control over this disease, I have it yet to learn; and if such is the fact, why does our author say Narcotics (in the plural number) as if all of them were equally efficacious for the restraint of Diarrhœa? It is indeed true that one Narcotic and one only, is the most effectual agent known for the direct and immediate diminution or even suspension of both the sorts of secretion in this disease; and the same article is equally efficacious for the direct and immediate diminution and even suspension of the preternaturally increased peristaltic action. In addition to this, it contributes more effectually than any other agent known, toward the obviation of morbid irritability and morbid susceptibility, in the parts which constitute the local seat of the disease. This same Narcotic directly diminishes all the constant secretions, except that from the skin; directly diminishes intestinal peristaltic action; directly diminishes uterine [parturiënt] contractions; and all these, as well in health as in disease; and in addition to this, it is the most certain Antirritant known. I specify all this to show that there is nothing indirect in the operation of this Narcotic upon Diarrhœa, and also in evidence that its powers are altogether unique in comparison with every other Narcotic. Now from ample experience of the use of Styptics in Diarrhœa, I have long been satisfied that they are scarcely worthy of being mentioned as auxiliaries to this Narcotic in the treatment of this disease. It is by no means in Diarrhœa that the best effects of the Styptics are manifested. No speculations of the inexperienced, or of those who disregard experience, ought ever to induce a physician to postpone the use of this Narcotic to that of the Styptics, in the treatment of such a malady.

There are the same pathological conditions in Dysentery as in Diarrhœa, with two in addition, which precede, underlie and constitute the basis of the disease, viz. a Specific atonic Phlogosis of the mucous membrane of the upper and smaller intestines, and a constitutional febrile affection, always identical with some one of the species of the nosological genus Typhus which occurs in a separate and independent state. There is nothing in Dysentery to contraindicate the Styptics; but they are even of less service in this malady than in Diarrhœa. Styptics are not remedies either for Phlogosis or for Fever, however atonic both may be, and the fact that these two conditions exist, renders Styptics still less efficacious for the restraint of the vitiated and excessive secretions, and for the diminution of the inordinate peristaltic action. In fact I deem mere and pure Styptics as altogether worthless in Dysentery, notwithstanding they are so often and so highly recommended in it, by some physicians.

It has been frequently suggested to me, by those acquainted with my views respecting the class that I call Adenagics, that the Styptics must be intermediate between that class and the Tonics. Now the Styptics have indeed some thing in common with the Adenagics, viz. they exert their principal operation upon the secernents and absorbents, though it is an operation quite different in quality. But what they have in common with the Tonics, I know not, since they do not invigorate, i. e. increase vital energy and strength of action in any manner or degree. It is true, as I have already said, the Styptics some times have a bitter Tonic principle, and consequently a Tonic power superadded; but this does not cause any resemblance between a Styptic power and operation and a Tonic power and operation.

The power on which this class is founded, appears to have been known from the earliest records of medicine; and the name by which I call it would seem to be older still. The Styptics act decidedly upon that part of the involuntary motor nerve of chymical action nutrition and reproduction which is sent to the secernents and absorbents, or in other words, the glandular system. Whether the vital contraction of the soft solids, which the Styptics produce, is any thing more than the effect of the vital elasticity which is exerted in consequence of the removal of distending matter by the absorbents, I know not.

As far as I know the Styptics appear to be wholly incapable of destroying life, in any quantity capable of being retained on the stomach. The essence of the operation of a Styptic may therefore be merely a diminution of secretory activity and an augmentation of absorbent activity.

This class has less synonymy than almost any other in the *materia medica*. Although the oldest name is that which I employ, and although there has never been a time when this has not been more or less used, still in modern times, it has been much more frequently called *Astringentia*, a name perfectly unobjectionable as respects its import, but contrary to the analogy of the names of the other classes, in the circumstance that it is pure Latin, instead of Greek, as it should be. The oldest appellation, which is perfectly unexceptionable in all respects, not only in import, but in formation, should always have the preference. This has long been an established principle, in most, if not all the other branches of natural history; and medicine being merely a branch of this same department of human knowledge, there is no good reason why the same rule should not be observed in it. The term *Systolica* has been proposed as a name for this class, that it may have a Greek appellation, in conformity with the other classes. Its signification of contractors, might be sufficiently appropriate; but yet it can not be more so than that of Styptica. The term *Depsica* has been proposed also, as a name of this class, it being a regular derivation from a Greek verb commonly used in application to the process of tanning. Now Styptosis is not tanning, and yet it expresses the operation of the tanning principle upon the living solid, just as tanning expresses the operation of the same principle upon the dead solid. The term *Depsica* might therefore be tolerated, if we had no better one; but it is much less eligible than the term Styptica.

Upon the whole, the Styptica as a class of remedial agents are not very highly important in the treatment of any very serious or intense disease; and diseases of little intensity and severity may perhaps always be more conveniently treated by those agents upon which we are obliged to rely in severe and intense diseases. I never yet met with any truly important disease, which could not be better treated by some other agents than the Styptics; and yet I have often found them useful in a small way, and more par-

ticularly as auxiliaries to some thing else that is much more valuable.

PROËM TO THE CLASS ADENAGICA.

The term Adenagica is derived from a Greek noun-substantive, signifying a *gland*, and a Greek verb signifying *to affect*; *to influence*; *to control*; *to lead*; *to conduct*; *to rule*; etc. Etymologically the term signifies articles which influence the glands or the glandular system.

Definition.—Adenagics are articles which exert a direct, an especial, a peculiar and a specific operation upon the secernents and absorbents or the glandular system generally, by which a greater or less change of action and condition is produced—a change manifested by a direct resolution of certain chronic, sub-acute atonic Phlogoses or Inflammations; certain Parabysmata and glandular enlargements; by the obviation of certain Dysthetica; by the improvement of certain vitiated Ulcers; by the relief or cure of certain cutaneous diseases; by the obviation of torpor and inactivity of all the secretories and excretories; and as is commonly said, though I think incorrectly, of the secretory apparatus of the liver; and by a consequent increase of the secretions and excretions, and as is commonly, but I think erroneously, believed, more especially of the biliary than of any other; and also by a diminution and improvement of the secretions and excretions where they are excessive and vitiated; the whole independent of any change in the degree of the vital energies or the strength of the action of the sanguiferous system, and not caused by any evacuation which may happen to be produced.

It is to be observed that this class is not founded upon the mere power of acting upon the secernent and absorbent or glandular system in any way, but on the power of acting upon it in a peculiar

manner which is explained generally in the definition, but which will be fully illustrated in the proëm to the class. But without reference to the quality of the effects, the true Adenagics do in fact operate either upon the whole, or at least, upon the greatest portion of the secernent and absorbent or glandular system, though different individual articles operate with very different degrees of intensity upon different parts. It must be understood however, that the number of individual agents of this class which do not fail of operating more especially upon some particular part or parts is probably not great.

The recognition of this power as a unity, and the founding of one single class upon it, appear to me to be new. Authors seem to have considered it as "legion," judging from the number of classes that have been founded upon it. I have now before me a list of more than twenty, and doubtless, with proper research, I might find more. But beside this, they have referred every individual agent properly belonging to this class, as I consider it to be rightly constituted, to some other class legitimately founded upon some different and distinct power; but this I shall specify and treat of hereafter. The name which I employ, and the definition which I give, are as new as the recognition of the power as a unity, and the foundation of a class upon it.

As the Adenagics are often incidentally, though not essentially attended with an evacuation, they may perhaps be considered as a connecting link between the first nexus, alliance or group of classes and the second.

As I shall very often have occasion to refer to the several parts of an Adenagic operation separately and by distinct appellations, it is proper in this place to mention and define the terms, and to point-out accurately the metes and bounds of the signification of each. Before mentioning these subordinate parts of the operation of the Adenagics, which are manifested in the secretories and excretories, it will be proper to say a few words in regard to the secretions and excretions. The secretions and excretions differ much among themselves, as respects their continuity and periodicity (a very bad word in all respects) and also in regard to the laws of their occurrence and recurrence. They are in fact

1. Constantly continuous and strictly involuntary, as *a* Ultimate assimilation; *b* Animal heat; *c* Urine; *d* Heat latent in va-

por of water; *e* Effete Carbonum; *f* Serum into shut cavities; *g* Mucus into open cavities. The secretion of saliva seems to be a constantly continuous and a strictly involuntary one, though it is subject to great fluctuations as respects its amount, according to other circumstances more or less under the control of the will.

2. Irregularity interrupted or periodical, and depending upon voluntary acts. *a* Gastric liquor; *b* Pancreatic liquor; *c* Bile; *d* Gall; *e* Milk; *f* Semen; *g* Tears.

3. Regularly interrupted or periodical and strictly involuntary
a Catamenia.

To what group of secretions does that of the vesiculæ seminales (incorrectly so called) belong? What is the nature and character of the secretion from the prostate gland? For myself I am destitute of any certain and true knowledge in regard to it.

I do not know whether any of the Adenagics ever affect Ultimate assimilation, which is doubtless a secretion, or not. I have some times imagined that some of them do this; but have found it exceedingly difficult to obtain absolute proof either one way or the other. Therefore I do not mention this as a subordinate part of an Adenagic operation. There are remedies however that operate upon this function, but they are not Adenagics.

I am not apprised that any Adenagic ever increases, or otherwise affects the production of animal heat, though I doubt not that it is extricated by the instrumentality of the secernents under the influence of the nerve of chymical action, etc. It would seem to be quite a different class of remedies that operates on this function.

That part of an Adenagic operation which is manifested by the discussion, dispersion or obviation of a Phlogosis or a Tumor of any sort, by the external local application of the Adenagic agent to the inflamed or enlarged part, I shall call *Discutient*. Cullen says that "Discutientia are medicines supposed to dispel tumor or hardness." He adds, "the operation of such medicines seems to be of different kinds, and therefore the general term should, if possible be avoided." (*Cul. Mat. Med. Bart. Edit. Philad. 1812, Vol. I, Pg. 117.*) This definition is too general, too loose, and too vague—a very common fault with all the definitions of some persons. In a majority of cases however, in which I have heard this term employed, it has been in conformity with my lim-

ited definition; but it must be admitted that it is not infrequently used more indefinitely. At all events, I shall always employ it just as I have defined it, so that I trust I shall be intelligible to every one. There is no distinct and specific Discutient power at present known in the materia medica; but all Discutient effects are produced by some power which is the foundation of a class, at least in the system which I employ. For example, some of the active Saline Antiphlogistics are generally considered as operating as Discutients in Entonic Phlegmonous Phlogosis. For myself, I think there is room for the question whether this sort of Discussion is any thing but mere Antiphlogistication, which is widely different from Discussion by Adenagy. The active Neuragics are considered as capable of proving Discutient in the same cases in which the active Antiphlogistics are reputed to be so. Discussion by Neuragy must be widely different from that by Adenagy or Antiphlogistication. Again the Oresthetics are commonly believed to be capable of operating as Discutients in certain atonic Phlogoses, and certain indolent tumors. But Discussion by Oræsthesis must be widely different from every other sort of Discussion that I have mentioned.

That part of an Adenagic operation which is manifested by the cure of certain cutaneous diseases by the internal use of the remedial agent, I shall hereafter designate by the term *Antipsoric*, without meaning to imply that this is the only mode of operation by which cutaneous diseases are remedied. On the contrary, these diseases are more commonly cured by the external topical application of remedies. When thus cured, it would seem to be some times accomplished by the slightest grade of an Oresthetic power, and some times by an Adenagic power. There is no true and proper Antipsoric power different and distinct from these two, and from every other power which is already the foundation of some class in the system which I adopt. An Antipsoric operation from the internal use of a remedy, I believe, is always a sure test of an Adenagic power. A vague and indefinite notion prevails among physicians, that the Antipsoric part of an Adenagic operation is identical with the Diaphoretic part; and in short, that Diaphoretics, whether true and proper ones, or such as are Diaphoretic by virtue of an Adenagic power, are all Antipsorics. In fact, it is supposed that sweating is remedial of cutaneous dis-

eases. I do not think that there is the least foundation for these opinions. When the skin is thoroughly diseased, its excretory function is always more or less disturbed ; and this disturbance is not usually obviated till there is a material relief of the cutaneous disease. The observation of this fact, and the putting of the effect for the cause has undoubtedly given rise to the opinion I am combating, and which, I think, has no just foundation in fact. With many of the present day the term Antipsoric is understood to mean curative of the Itch merely ; but the term Psora really has a much wider signification. According to Bateman, the ancients applied it to the scaly eruptions generally, and according to some of the Lexica, to cutaneous eruptions generally. Psoriasis is explained by Donegan as implying a remedy for cutaneous diseases generally, and consequently Antipsoric must have the same import, but with greater intensity on account of the prefix *Anti*.

That part of an Adenagic operation which is manifested by the production of a direct resolution of certain chronic, sub-acute and acute atonic Phlogoses or Inflammations ; of certain Parabysmata and other glandular tumors ; by the obviation of certain Dysthetica or Cachexies ; and by the improvement of certain vitiated Ulcers, by means of the internal use of the Adenagics, I shall hereafter designate by the term *Resolvent*. It is to be observed however, that the production of a direct resolution of a Phlogosis does not in all cases prove that there has been an Adenagic operation. An entonic Phlegmonous Phlogosis can not be resolved by any known Adenagic ; but requires Antiphlogistication for this purpose. Again, an exquisitely irritative atonic Phlogosis may often be perfectly resolved by a pure Narcotic operation as well as by an Adenagic one ; and in many instances I think better. Of course the direct resolution of a highly irritative atonic Phlogosis by the internal use of an individual medicine, does not indicate whether such article is Adenagic, Narcotic, or Antiphlogistic. This must be determined by other means. The effect of the internal use of the agent either upon Parabysmata and glandular tumors ; upon the Dysthetica or Cachexies ; upon Vitiated Ulcers ; and upon the excretions generally, will enable us to decide the question. When an internal remedy produces a direct resolution of a Phlogosis, without any Antiphlogistic operation on the

one hand, or any Narcotic operation on the other, it is my present belief that we may always infer that there has been an Adenagic operation. Except in the instances just specified, a true Resolvent operation is one of the best tests of an Adenagic. Cullen says that Resolventia is "a term often employed in the same sense as that of Discutientia, for medicines suited to remove those external tumors supposed to depend upon obstruction; but so far as employed either externally or internally, they are supposed to have their effects by destroying the cohesion of concremented fluids." "The term appears to be employed upon a very uncertain foundation." (*Cull. Mat. Med. Bart. Edit. Philad. 1812, Vol. I, Pg. 122.*) In my opinion, this is a very loose and very incorrect definition. The terms Resolventia and Discutientia are by no means synonymous. The former might possibly be considered as including the latter, but the latter can not with the least shadow of propriety be made to include the former. The theory, or rather the hypothesis of the causation of tumors can not enter into the definition of either of these terms, and such a mechanical one is *prima facie* absurd. The hypothesis of the *modus operandi* of the agent in effecting a cure is equally absurd. After such a definition, well might Cullen say that "these terms appear to be employed upon a very uncertain foundation." I am satisfied that my own definitions are in conformity with the intrinsic significations of the two words, and also more conformable to their use among physicians, though I am perfectly aware that these, as well as all other terms in medicine, have often been employed vaguely and incorrectly. I comment upon this definition by way of protesting against the supposition that I use these terms in such a sense. I have already specified the cases in which the Adenagics prove Resolvent; and also those in which the Narcotics and Antiphlogistics produce the same effect. There is no more any distinct and specific Resolvent power, than there is a distinct and specific Discutient power, but all Resolvents operate as such, by virtue of some power that is the foundation of some class of remedies, at least in the system which I employ.

In Dyspnœa exacerbans and Dyspnœa continua, and in all probability Asthma verum likewise, the excretion of effete Carbonum from the lungs is greatly diminished. Almost all the Adenagics of any material power contribute more or less to restore this

function to its natural and healthy state ; but other remedies of a widely different character seem to be required in conjunction with the Adenagics. If this subordinate part of the operation of an Adenagic were to receive a name it would be *Anthracagogue*. Such an effect is produced by Erethistics, perhaps by Oresthetics, by Antisbestics, and to a greater or less extent by Tonics, as well as by Adenagics. But all these Anthracagogue effects differ essentially and materially from each other, being produced by different and distinct powers. There is no mere and pure Anthracagogue power, different and distinct from all these, at present known.

I have no knowledge that any of the Adenagics ever increase the excretion of serum from the serous membranes into any of the shut cavities ; and if there were articles that operated in this manner, their effect would not be medicinal, but on the contrary morbid ; and the disease produced would be Hydrops or Dropsy. A medicinal Orrhagogue is therefore impossible. It is said that if the venom of *Uropsophus durissus* is taken in too large quantities and continued too long it produces what is called effusion from the serous membranes ; but I presume that it operates in some indirect way. I have never heard that this substance was ever suspected of being Adenagic. I have been told that if Arsenic is given too freely, and its use continued too long, it will produce what is called effusion into the cellular substance. Now I believe that the cellular membrane is a serous one, and that Arsenic is Adenagic ; but still I do not believe that it produces this effect directly, even if it produces it at all. I have known Arsenic produce a puffy swelling of the backs of the hands, and under the chin, but as far as it proceeded, it did not appear to be of an *Œdematous* character. I can not say however that it might not have been such, if it had been suffered to proceed considerably farther.

There are assuredly a few Adenagics that increase the secretion of mucus from all the mucous membranes into the open cavities. This part of their operation I shall hereafter call *Blennagogue*. Some Adenagics even when taken where there is no disease of the secernents and absorbents, or in other words, of the glandular system, decidedly increase the natural and normal secretion from the mucous membranes—at least from all of them upon which we

can make observations. I have certainly witnessed a general Blennagogue effect from *Apocynum Androsæmifolium*, *A. Canabinum*, *A. Hypericifolium*, and *A. pubescens*, taken by way of experiment, in perfect health, and there is testimony to the same effect from others. The lining mucous membrane of the upper and smaller intestines is well known to be capable of having the secretion from the mucous follicles so changed as to appear like serum or water; while, at the same time, it is very extraordinarily increased in quantity, and attended with a proportional increase of intestinal peristaltic action. This, when produced by certain medicinal agents, constitutes Catharsis; but when it takes place independent of any such agent, it constitutes Diarrhœa. This is not by any means true and proper Adenagy, but quite a different thing. Numerous Adenagics produce this effect, but never, unless they have a true and proper Cathartic power conjoined with their Adenagic power. Catharsis is easier produced in health, than in many diseases; but inferences in regard to simple and pure Adenagics, can not be safely deduced from articles which are both Adenagic and Cathartic, any more than from simple and pure Cathartics.

I have no reason to believe that there is any medicine known, or in fact, in existence, which, when taken into the stomach, will act upon one mucous membrane in preference to an other, unless one mucous membrane happens to be diseased in such a manner as to render it more susceptible to the influence of a given medicine, than healthy mucous membranes. These remarks are intended to imply an utter disbelief in the existence of any such medicinal agents as true and proper Chremptics or Expectorants, i. e. articles capable of operating directly and exclusively to increase secretory activity in the mucous follicles of the bronchial membrane, without acting in any degree upon any other of the secretents and absorbents, or, in other words, the glandular system; or in the existence of any Adenagics, which, as a subordinate part of their operation affect one mucous membrane in preference to another, unless such membrane is so diseased, as to render it more susceptible than the rest of the mucous membranes to a given specific impression. There might be true and proper Blennagogues, i. e. articles which operate immediately, directly, and exclusively to increase secretory activity of the mucous follicles of

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I have no reason to believe that there is any medicine known, or in fact, in existence, which, when taken into the stomach, will act upon one mucous membrane in preference to an other, unless one mucous membrane happens to be diseased in such a manner as to render it more susceptible to the influence of a given medicine, than healthy mucous membranes. These remarks are intended to imply an utter disbelief in the existence of any such medicinal agents as true and proper Chremptics or Expectorants, i. e. articles capable of operating directly and exclusively to increase secretory activity in the mucous follicles of the bronchial membrane, without acting in any degree upon any other of the secretents and absorbents, or, in other words, the glandular system; or in the existence of any Adenagics, which, as a subordinate part of their operation affect one mucous membrane in preference to another, unless such membrane is so diseased, as to render it more susceptible than the rest of the mucous membranes to a given specific impression. There might be true and proper Blennagogues, i. e. articles which operate immediately, directly, and exclusively to increase secretory activity of the mucous follicles of

all the mucous membranes, without affecting any other part or parts of the secernent and absorbent or glandular system. This is what seems to be intended by the term Expectorant or more correctly Chremptic; but I know of no such articles. All that are employed as such, are Blennagogue, Chremptic or Expectorant, merely as a part of an Adenagic operation. It is possible that true, pure or mere Blennagogues may yet be discovered when they are searched-for, with a right understanding of their difference from an Adenagic.

That part of an Adenagic operation, which consists in a preternatural secretion from the salivary glands, produced by an Adenagic taken into the stomach, I shall call either *Sialagogue* or *Ptyalagogue*, and such secretion I shall call either Sialism or Ptyalism. I have no knowledge that the Sialagogue or Ptyalagogue part of an Adenagic operation is ever of any remedial utility. There might be agents which, when taken internally, would act directly and immediately upon the salivary glands, increasing their secretory activity, without operating upon any other part of the secernent and absorbent or glandular system, which would constitute true and proper Sialagogues or Ptyalagogues; but I know of no such articles. There are articles, which by topical application to the mouth produce Sialism or Ptyalism; but these are quite different articles, destitute of all Adenagic power.

That part of an Adenagic operation which is manifested by the obviation of torpor and inactivity of the excretories of the hepatic apparatus, and by an increase and improvement of its secretion, when it is habitually diminished and vitiated; or by a diminution and improvement when it is habitually excessive and vitiated, I shall designate by the name of *Cholagogue*. Bile is secreted only periodically, i. e. while food is undergoing digestion in the alimentary canal; and hence it is less affected by the Adenagics than the constant secretions. However as its secretion is required so frequently, it approaches more nearly to a constant secretion than the catamenia, the semen and milk, and is therefore more liable to be affected by the Adenagics than the others are. Bile is probably an excrementitious secretion, though it may perform some useful office in the alimentary canal before it is eliminated. It probably contributes to separate the nutritious from the fecal part of the chyle. I can not pretend to say that it

can make observations. I have certainly witnessed a general Blennagogue effect from *Apocynum Androsæmifolium*, *A. Canabinum*, *A. Hypericifolium*, and *A. pubescens*, taken by way of experiment, in perfect health, and there is testimony to the same effect from others. The lining mucous membrane of the upper and smaller intestines is well known to be capable of having the secretion from the mucous follicles so changed as to appear like serum or water; while, at the same time, it is very extraordinarily increased in quantity, and attended with a proportional increase of intestinal peristaltic action. This, when produced by certain medicinal agents, constitutes Catharsis; but when it takes place independent of any such agent, it constitutes Diarrhœa. This is not by any means true and proper Adenagy, but quite a different thing. Numerous Adenagics produce this effect, but never, unless they have a true and proper Cathartic power conjoined with their Adenagic power. Catharsis is easier produced in health, than in many diseases; but inferences in regard to simple and pure Adenagics, can not be safely deduced from articles which are both Adenagic and Cathartic, any more than from simple and pure Cathartics.

I have no reason to believe that there is any medicine known, or in fact, in existence, which, when taken into the stomach, will act upon one mucous membrane in preference to an other, unless one mucous membrane happens to be diseased in such a manner as to render it more susceptible to the influence of a given medicine, than healthy mucous membranes. These remarks are intended to imply an utter disbelief in the existence of any such medicinal agents as true and proper Chremptics or Expectorants, i. e. articles capable of operating directly and exclusively to increase secretory activity in the mucous follicles of the bronchial membrane, without acting in any degree upon any other of the secretants and absorbents, or, in other words, the glandular system; or in the existence of any Adenagics, which, as a subordinate part of their operation affect one mucous membrane in preference to another, unless such membrane is so diseased, as to render it more susceptible than the rest of the mucous membranes to a given specific impression. There might be true and proper Blennagogues, i. e. articles which operate immediately, directly, and exclusively to increase secretory activity of the mucous follicles of

power of producing porraceous or bottle-green discharges from the alvine canal. But as I show else where, this is no evidence at all, since these green secretions are not produced by the liver, and are not bile; but on the contrary, are merely vitiated secretions from the mucous follicles of the upper and smaller intestines. Some times however, they have gall mixed with them. Now gall is essentially different from bile, and is not produced by the liver, since the cystic and the hepatic ducts frequently enter the intestines separately. In this case, the vesicula fellis or the gall bladder is as well filled, as when the two excretory ducts unite and enter the intestines together. In the latter case, the two secretions are as different as in the former. I consider it as quite certain that the Adenagic power of both these articles has been greatly overrated, and more especially their Cholagogue power. I do not believe that either of them possesses any material degree of the latter at least. I have never yet succeeded in producing bright and lively yellow or gold-colored discharges from the alvine canal, either by the Disoxyd or the Dichlorid of Mercury, or any other Mercurial; nor have I ever witnessed the production of such discharges by any other physician. This is the true color of bile, and this must be the color of the alvine discharges to indicate the presence of bile in them. I have seen a physician raise his hands in astonishment at the expression of these views; yet he has told me afterwards, that having had his attention once turned to the subject, observation and experience had subsequently taught him their perfect truth, though previously, he had fully believed the current opinions, but yet without the least investigation on his part.

Sir Benjamin Brodie says "some times Colchicum produces yellow stools showing that it stops the secretion of bile; and to counteract this tendency, you should add one or two grains of Blue pill to each dose." (*Lond. Med. Gaz. Oct. 27, 1838, Pg. 151.*) This shows clearly upon what foundation Disoxyd and Dichlorid of Mercury have been reckoned Cholagogues. I think it may be considered as certain that a golden-yellow color of the alvine discharges always indicates the presence of an unusual quantity of true bile in them. There is a dull, dirty yellow color of these discharges, in some cases of rather urgent and protracted chronic Diarrhœa, resembling the lees of cider, which does not

indicate the presence of bile, but rather its absence. This quotation from Sir Benjamin Brodie would seem to show that he considered the porraceous or bottle-green color of the discharges, that are produced by the Mercurials as indicative of the presence of bile. I have very often asked physicians, what they considered as the test of the presence of bile in the alvine discharges; and except in a single instance the answer always has been, the peculiar green color above specified. One gentleman, and one only, answered, a golden-yellow color as above described. A few who gave a different reply at first, have afterwards corrected their answer, I suppose, in consequence of reference to authorities. Sir Benjamin Brodie therefore is not alone in his error. As Adenagics I do not think that the Mercurials affect materially any of the secretions except the constantly continuous and strictly involuntary ones, unless the saliva belongs to a different group.

I do not know whether any of the Adenagics ever affect the fellivesicular secretion or not. In reality I know nothing about the functions of the gall or the laws of its secretion. The prevalent notion that the gall-bladder is a mere reservoir of the bile, I hold to be utterly untenable, because the excretory duct of the liver and that of the gall-bladder frequently enter the intestines separately, and at some distance from each other, as heretofore stated, and because the two secretions appear to be of a different character, so far as I can judge from the best specimens of the hepatic secretion that I have ever been able to obtain. It is the testimony of various authors that bile is of a golden-yellow color, and of a sweetish mawkish taste, while gall is of a bottle-green color, and of an intensely bitter taste. After my first observation of the separate entrance into the intestines of the ducts of the liver and the gall-bladder, which was on the dissection table of a medical school, I caused examination to be made in regard to this point, on all other dissected subjects in the same school, and on all subjects examined after death, in the private practice of myself and my friends and particular acquaintances, for a considerable length of time, and the result of such examination warranted the conclusion that this anomaly is comparatively common.

I have no knowledge of any analysis of bile, all the pretended ones being confessedly analyses of gall. In several instances of

death from acute disease, post-obit examinations have shown that the subject had no gall-bladder at all, and yet had been previously as healthy as people in general. I have caused frequent search to be made for this anomaly, not only on the dissection table of medical schools, but at post-obit examinations in private practice; but I have not found it very common.

I know of no reason to suppose that the secretory activity of the pancreas is ever affected by the Adenagics; but if it were, I know not how it would be ascertained. I have always supposed that the pancreatic secretion stands in the same relation to that more refined part of primary digestion which is performed in the upper and smaller intestines, that the gastric secretion stands in, to that coarser part of primary digestion, which is performed in the stomach; but exactly how this can be proved I know not. It has long been my opinion that the pancreatic liquor is secreted only during the digestion of food in the upper and smaller intestines, in perfect analogy with the gastric liquor. If my conjecture in regard to the function of this secretion is correct, it is doubtless a periodical, or at least a remittent secretion, and therefore much less likely to be affected by Adenagics than a perfectly continuous secretion. But, as appears to me, we know with certainty very little on this subject.

That part of an Adenagic operation which is manifested by the production of the catamenial secretion when it has been retained beyond the period of puberty; by the restoration of it when it has been morbidly suspended; or by the augmentation of it when in its natural state, I shall call *Emmenagogue*. As a general rule I doubt whether these effects can be produced, except at, or about the regular period for the occurrence of this excretion; but there are doubtless exceptions to this law. I am acquainted with a single article, which I have repeatedly known to produce this excretion at any time between the regular periods for its recurrence, and that in a person in whom this function was previously in a perfectly natural and healthy state; but I can not say that this will always operate in this manner. This agent is of course an Adenagic. Now if there is one article that operates in this manner, I can not doubt that there are more, though I do not happen to be acquainted with them. I am not experimentally acquainted with any true and proper Emmenagogues, i. e. articles which

operate immediately, directly and exclusively to increase the activity of the catamenial excretories of the uterus, without affecting any other subordinate part of the secernent and absorbent or glandular system. It is claimed however, that two articles of this character, and only two, are at present known. If there are two, it is highly probable that there are more. I know of no reason a priori why there should not be true, proper and exclusive Emmenagogues. It is only a question of fact whether they exist or not.

That part of an Adenagic operation which is manifested by a preternatural increase of the renal secretion, I shall call *Uragogue* or *Diuretic*. There are true and proper and exclusive Uragogues or Diuretics, i. e. articles which operate immediately, directly and exclusively to increase the secretory activity of the kidneys; but these require discrimination and distinction from the Adenagics:

That part of an Adenagic operation which is manifested by a preternatural increase of the excretion from the skin, viz. the effete heat of the system in a latent state in the vapor of water, I shall call *Hidrotagogue* or *Diaphoretic*. It might with more propriety be called *Thermagogue*, since heat is the essential part of the excretion, the skin being one of the four great emunctories of the system. There are true and proper Hidrotagogues, Diaphoretics, or Thermagogues in contradistinction from Adenagics, i. e. articles which operate immediately, directly and exclusively to increase the excretion from the skin, without any operation upon any other subordinate part of the secernent and absorbent or glandular system. It is always important to discriminate between these and Adenagics, which is not always done.

The seminal or testicular secretion is interrupted and irregularly periodical and exclusively dependent upon voluntary actions. As appears to me it follows very different laws from any other interrupted and irregularly periodical secretion. It is undoubtedly distinct from the secretion contained in the vesiculæ seminales (incorrectly so called) and is produced according to different laws. It is not at all probable that the seminal or testicular secretion is ever affected by any of the Adenagics, since it takes place only during a perfectly voluntary act. It appears however to be increased by that operation called Aphrodisiac, by whatever article that may be produced.

I know nothing at all about the laws of the production of the secretion of the vesiculæ seminales, though I have always supposed it to be produced only under the influence of venereal desire or appetite. I know of no reason for concluding that this secretion is ever affected in any manner or degree by any of the Adenagics.

I do not think that the secretion from the Prostate gland, which is small in quantity, ministers in any way to reproduction. But whether it does or not, I know of no reason to conclude that it is at all affected by any of the Adenagics.

I am not apprised that the mammary secretion during lactation is capable of being affected by any of the Adenagics. At all events, under ordinary circumstances during lactation, I have often seen Adenagics administered with the greatest freedom, without the least apparent effect as respects the amount of milk secreted. Various articles however, are constantly mentioned as *Galactagogues*. They are mostly Lamiaceæ containing an aromatic Essential Oil. What foundation there may be for the ascription of Galactagogue power to them I know not. *A priori* I should not be inclined to give any credit to the ascription; but it is constantly repeated, and so far as I know, never contradicted—not much evidence of its truth, it must be admitted. I never had opportunity to make any observations upon this subject. I know however, that Alcohol some times proves decidedly Galactagogue, so that there is certainly such an operation.

I have said elsewhere that some of the Adenagics some times restrain and diminish inordinate or excessive secretions. They do this however, only under certain circumstances. When ever there is great exhaustion of the secernents of any particular texture or organ, and in consequence of a deficiency of resistance to the vis a tergo, it pours-fourth a large quantity of an imperfectly elaborated or positively vitiated excretion, as in the case of the bronchial mucous membrane in *Blennorrhæa bronchiales* or *Phthisis pyoblennorrhœica*; in the vaginal mucous membrane in *Blennorrhæa vaginalis* or *Leucorrhœa*; perhaps in the renal glands in non-saccharine Paruria, Diabetes; etc. certain Adenagics will certainly contribute to restrain or diminish, in a greater or less degree, the profuse or colliquative effusion. Here the question may very properly be asked whether this is accomplished by a

mere and pure Adenagic operation, or by some operation materially and essentially different? It is very certain that every Adenagic will not accomplish this purpose. It is capable of being accomplished by the Neuragic Adenagics, Iodine and Bromine. It is capable of being accomplished by certain Erethistic Adenagics. Will mere Neuragics and mere Erethistics relieve the diseases here specified? I have never ascertained this definitely, and therefore I can not say with any certainty whether the relief is produced by the Adenagic power of the articles used, or by the Neuragic or Erethistic powers.

It is to be particularly noticed that though we speak and write of an Adenagic power as exerted upon the secernent and absorbent or glandular system generally, yet this is not to be understood without more or less limitation. All those secernents or glands which are not affected by any Adenagic are of course excepted from the general statement. It may be viewed as quite certain that all parts of the glandular system are not equally affected by the Adenagics; and it is very frequently the fact that some parts are not affected at all, by certain Adenagics. Certain Adenagics exert a greater relative influence upon particular glands than upon the glandular system at large. The Mercurials are well known to be liable to affect the salivary glands disproportionately; and a few other Adenagics occasionally, but not generally, operate in the same manner. All the Mercurials however, are not equally liable to affect any particular glands in this way. I never knew Chlorohydrargyric Acid, or Prctochlorid of Mercury; Cyanohydrargyric Acid, or Protoçyanid of Mercury; etc. to occasion ptyalism, unless this effect has been repeatedly or recently produced by some other Mercurial. Hence a certain set of Mercurials is very properly spoken-of as salivating ones, and a certain other set as non-salivating ones. Digitalis purpurea and other species of this genus usually affect the renal glands disproportionately, just as certain Mercurials do the salivary glands; and the degree of their influence may be varied and modified by external circumstances in an analogous manner.

Particular regimen and particular auxiliaries will frequently cause an individual Adenagic to act disproportionately—in fact almost exclusively upon particularly excretories. By appropriate and thorough regimen an individual Adenagic may often be made

to operate almost exclusively as a Diuretic or Diaphoretic. Altogether the most effectual Diuretics or Uragogues are certain Adenagics whose influence is more especially determined (as the common language is) to the kidneys. This however, may be due to the fact that in Dropsy (the chief disease in which Diuretics are of much importance) Adenagics are as much indicated as Diuretics.

The only Blennagogues and Emmenagogues at present known, are Adenagics whose influence is more especially determined to the mucous membranes, or the catamenial excretories. In this sense there may be said to be such a part of a prescription as a *dirrigens*.

Do not the Adenagics always affect diseased secernents and absorbents or glands sooner than they affect healthy ones? This is assuredly true of a certain number of them, if not of the whole. I think that this is invariably the law of the operation of Iodine, Bromine and Chlorine. A professional friend once mentioned to me what he considered an exception. He said that the inmates of a certain State-prison (who were kept upon a very narrow and limited range of diet, and at the same time were worked solely in reference to the profit of the State, rather than in reference to their health and strength) were peculiarly subject to what the surgeons have some times called "the tuberculous disease," that is Struma of the serous membranes, whose principal topical development consists in a great multitude of tubercles, attended with occasional paroxysms of acute adhesive Strumous Phlogosis and acute Hectic. In the intervals of these paroxysms, he had been in the habit of treating these subjects efficiently with Iodine, but without the aid of either of the active principles of Cinchona, which the State could not afford to criminals. A rather frequent consequence of this treatment was an absorption of the testes. This my friend mentioned as an exception to the law now under consideration. I suggested that instead of this, it might contribute to indicate that the testes were in fact diseased. He immediately turned his attention to this point, and found that such was most unequivocally the fact. Indeed on careful examination, he found all or nearly all the glands that can be examined externally in a state of greater or less disease.

There are numerous articles which possess an Adenagic power

and no other; and yet the pure and simple Adenagics are by no means the most active articles of the class. The power and operation which I denominate Adenagic, appears to me to be both certain and prominent from nearly every individual article belonging to the class, provided it is freely; efficiently and properly used; and it is, at the same time, a power and an operation of great importance in the treatment of numerous diseases. The class of Adenagics is one of the most numerous in the *materia medica*; and yet the power on which it is founded has hardly been clearly and distinctly recognized by any writer on this department of medicine. So far as I have been able to ascertain, no treatise on pharmacology contains a clear and explicit definition of Adenagics; nor has any author noticed them as constituting a distinct and peculiar group of agents.

As a matter of observation and experience, I think that the Adenagics generally possess less power and exert less influence in the diseases of the brain, more particularly its Phlogoses, than in the diseases of any other viscus.

We commonly say that in a natural or healthy state of the secretant and absorbent or glandular system, a moderate use of the Adenagics slightly increases the secretions and excretions; but this is to be understood with considerable qualification and limitation. It will at once be obvious that the preceding statement can have reference only to the regular and constantly continuous secretions and excretions. When Adenagics are employed with great freedom where there is no disease of the secretants and absorbents, or in other words of the glandular system, their effects are very various, according to the intensity and the peculiarity of the power of the Adenagic used, and the degree and quality of the susceptibility of the subject using it. In some cases there will be a moderate increase of all of the secretions which are not periodical merely. In some cases there will be an increase of only a single secretion, as, for example that from the kidneys—that from the skin—or even that from the liver. In reality the hepatic secretion is a periodical one, since, in health, it takes place only during the primary digestion of food; but this process occurs so frequently as to render the secretion under consideration more like a continuous than a periodical one. I suppose that the same may be said of the gastric and pancreatic secretions, that has been

said of the hepatic secretion ; and quite likely of the fellyvesicular secretion also ; but we know very little of either of these. In some cases there will be merely a slight change in the quality of the renal, or the cutaneous, or some other of the non-periodical secretions. The irregularly interrupted or periodical secretions and excretions of course can not be affected, unless the Adenagics is administered freely while they are actually taking place. But even to this, there are occasional, though rare exceptions. Sometimes one of the periodical secretions, viz. the catamenial, will be induced or increased. It is to be remarked that when the secretions and excretions are excessive as well as vitiated, the Adenagics not only change but often restrain them ; and on the other hand, when they are deficient as well as vitiated, they both change and augment them. Mere augmentation in a moderate degree is commonly their sole effect, when given for some time in a state of health.

Many of the most active Adenagics, when given with sufficient freedom, have seemed to me to produce what may be called an Erethistic effect. Such Erethism however is always of a peculiar character in comparison with that produced by any other class of agents. This Erethism, if it is truly such, is always manifested in the parts dependent upon the nerve of chymical action, nutrition and reproduction. For example, I think I have seen Erethistic effects in the function of primary digestion from certain Adenagics. I can not feel certain whether I have ever seen Erethism in the sanguiferous system or not ; but I have seen a disturbance or irritation of it, from too large a quantity in the twenty-four hours, and this too long continued, that might well enough be considered as Erethism. Does not Iodine some times produce an Erethism in the secernent and absorbent or glandular function ? I can not say that I ever witnessed any thing of this sort from this article ; but if testimony may be relied-on, such effects have often resulted from its very free and protracted use. I think I have also seen Erethistic effects in the function of reproduction, from certain Adenagics. Several of my professional friends have repeatedly told me that they had witnessed Aphrodisiac effects from some of the Adenagics ; indeed a considerable number of my patients have informed me of effects produced upon themselves, which would commonly be reckoned as Aphrodisiac, un-

less they were more properly Erethistic. Ordinarily an Aphrodisiac effect implies not only an increase of venereal appetite, but also an increase of the power of gratifying it. So far as this goes at least, it implies an increase of reproductive power. Perhaps any article that produces any degree of Erethism in the function of reproduction, may properly be reckoned as Aphrodisiac, in one sense of this term; and yet I do not believe that every Aphrodisiac effect is an Erethistic effect, since these latter differ very greatly, as produced by different classes of medicines, and even as produced by different articles of the same class. I have too often received testimony to the Aphrodisiac effect of good *Conium maculatum*, and this when administered for intirely different purposes, to have any doubt upon the subject. It is recommended by authors not only for Agenesia Impotentia, but also for Aphoria of various sorts; and I have known both of these diseases obviated by it. When there is Agenesia from deficiency in the Semen masculinum of the vibratile elongated corpuscles or cells, once supposed to be animalcules, I have reason to believe that there are a certain number of Adenagics, that are capable of remedying even this difficulty; but they all possess other powers in addition, and in a more prominent degree than they possess Adenagic powers; so that it is difficult to say precisely to what the operation in question is due. In several cases, where persons had been married eight or ten years without offspring, I have known a thorough use of good Extract of *Conium* employed by the party with whom the difficulty was supposed to exist, result in the subsequent birth of one, two or more children. Again when, in the course of a few years after marriage, there had been one, two or more children, and then a suspension of child-bearing for ten or a dozen years; after a thorough course of good Extract of *Conium* taken by the party in fault, I have known one two or more children born. I recollect prescribing Extract of *Conium* for a lady who had ceased for a long time to bear children. At the time of my prescribing for her she had some chronic difficulty, I forget what it was, though it could not have been of long duration. I made several calls, at comparatively long intervals, and at each was informed that she was better, and apparently continuing to improve. At last, at one of my visits, her conduct was very petulant, to say the least. She told me she had discontinued the

medicine and should take no more of it; but I could not ascertain the reason of her rejection and refusal of it. In the meantime her husband sat-by, laughing. At last the lady left the room apparently quite angry. Her husband then informed me that she had just become gravid, and at a time when she considered that her previous children were too old, and at what she considered too late a period of her life for child-bearing, since she was a little past forty years of age. He said she considered her existing condition as due to my medicine. I answered that I thought she must, at least, divide the blame between him and my medicine. Now Conium is Narcotic and its Extract (at least when well prepared) is Adenagic. Beside these, it is either Erethistic or Aphrodisiac. But is the last different and distinct from its Narcotic and Adenagic powers? I have always had doubts upon this point, being inclined to consider it as a peculiarity either of its Narcotic or Adenagic operation. At all events, I have very often known it produce the effects in question, whatever they may be.

A free and protracted use of Iodine is said to prove Aphrodisiac, i. e. to increase venereal appetite and the power of gratifying it: Valetudinarian women who have been married a number of years without children, not infrequently become gravid after a thorough course of Iodine. So many facts of this general character have been reported, and many of them in regard to simple and pure Adenagics, that I should think there could be no reasonable doubt either that they are Aphrodisiac, or that they sometimes produce Erethism of the reproductive function, which I am unable to decide. Admitting that a mere and pure Adenagic power is always to a greater or less extent Aphrodisiac (some times but very slightly so, and some times considerably so) yet as an exhausting operation is always Antaphrodisiac, all those Adenagics that exhaust must have their Aphrodisiac operation counteracted by their exhausting operation.

There are very many simple or pure Adenagics, i. e. such as possess no other different and distinct power or powers in addition. So far as the universality of their action is concerned, this group is commonly said "to promote the fluid secretions." As far as I could ever ascertain the import of this phrase, it is intended to imply that they more especially increase the renal or

cutaneous excretions, or both. But these are never the most active articles of the class ; and in fact, they are often among the feeblest.

An Adenagic power is not infrequently accompanied by some other power, which is the foundation of another class, and whose operation or effect never constitutes any part of that of an Adenagic. In the present state of my knowledge, I am in the habit of saying that there is no article of vegetable organic origin (except a few plants that contain such an abundance of some one of the Oxygen Acids of certain compound radicals of H. C. particularly in their fruits, and fewer plants still which contain a sufficient amount of Nitrate of Potassa to render them such) which are Antiphlogistic. When I say this however, I must not by any means be understood that there are no articles of vegetable organic origin that possess any exhausting power. Among the vegetable Adenagics there are numerous highly exhausting articles (which contain none of the Antiphlogistic vegetable Acids, and no Nitrate of Potassa) as I should think sufficiently exhausting to be Antiphlogistic, if they were not of vegetable origin ; and they may be so, for all the observations that I have ever made in relation to their capability of obviating phlogistic diathesis. Indeed from their great power of exhausting, I should think a priori that they must be positively Antiphlogistic, if all physicians did not deny it. I must confess however, that I do not deem this a very conclusive evidence.

What article of the *materia medica* is more exhausting than *Colchicum autumnale* when efficiently employed, while at the same time, it is actively Adenagic-Hydragogue-Cathartic and Emetic. Although its hydragogue Catharsis and Emesis may enhance its exhausting powers, yet its exhausting effects always precede its Catharsis and Emesis, showing clearly that it is a direct exhausting agent independent of its evacuant operation. I have seen a number of deaths produced by this article, and in all of them, what I deemed a fatal amount of exhaustion always took place before the occurrence of the Catharsis and Emesis. The same has been true in all the reported cases of death from this article. With such powers, and a capability of producing such effects, I should not think that *Colchicum autumnale* could possibly fail of proving Antiphlogistic, though I never had an opportunity to witness its employment in any entonic disease.

There are numerous other vegetable Adenagics that appear to be directly exhausting to a considerable degree, but I believe none of them so much so as *Colchicum autumnale*. Their exhausting power is however sufficient to do much injury in many atonic cases, in which they are employed for their Adenagic operation. I can not now think of any one of them, that is as likely to prove truly Antiphlogistic in an entonic disease, as the species of *Colchicum* just treated-of. I have been called in consultation, a considerable number of times, to prescribe for patients almost in articulo mortis, from exhaustion produced by *Colchicum* administered too freely and too long, for Rheumatagia (to which disease it is altogether inappropriate) or even for Rheumatismus. The disease for which the *Colchicum* was prescribed, was little (and some times not at all) benefited, as I supposed, because it was too atonic from its very outset, to be relieved by such an exhausting agent, while the patient had quite an extreme degree of that very peculiar exhaustion incapable of being affected by any amount of Alcohol, which *Colchicum* is so liable to produce, together with the stomach intolerant of every thing, and the Diarrhœa wholly uncontrolable by *Papaver*, or any thing else. Till I suggested it, the physician in attendance had never even suspected that the *Colchicum* employed had the least instrumentality in producing the hopeless condition of the patient, and could hardly credit it even then; so inattentive are many of our profession as respects nice observation.

Elsewhere I have more than once mentioned certain compounds of Iodine, Bromine and Chlorine, with several of the elements near the electro-positive extremity of the scale, which are often prescribed by physicians, for their Adenagic operation, but which constantly do great injury by their exhausting effects. First and last, I have seen a considerable number of cases of Struma irreparably injured by these articles, and always without any material or even appreciable benefit to compensate; so that I have long wondered that physicians should continue to prescribe them. I think it quite probable that these compounds might prove Antiphlogistic in truly entonic diseases; but this is contrary to the prevalent professional opinion; and I have no experience to the contrary. It appears to me quite certain that Iodine is not exhausting, when it is so managed as not to disturb the stomach

in any manner or degree. I have known Strumous patients leave their family physician, to whom they were strongly attached, and apply to another, because their family physician would persist in prescribing Iodid of Potassium, which, the patients said truly, always impaired appetite and digestive power, and weakened the system at large to a very inconvenient degree; an operation which was very obvious to the patient, but to which the physician was blind. I have often been consulted by such patients, so that I very well know that there was not a misapprehension of their own condition and circumstances. I do not remember that I ever succeeded in persuading any one of them to take Iodine afterwards, either by itself, or in any other state of combination, so strongly were they impressed with the notion that Iodine necessarily produces exhaustion. They could not at all understand that it was the Potassium, and not the Iodine, that had debilitated them. I have repeatedly seen great injury done to Strumous subjects, by a long course of Iodid of Potassium internally. I consider it as well established that all debilitating measures or means aggravate Struma, and therefore I would interdict all such, in all cases of this disease.

After being fully convinced that the Protiodids and Protobromids of Potassium, Sodium and Calcium were injurious on account of their exhausting operation, I made trial of the Deutiodids and Deutobromids of Potassium, Sodium and Calcium, in the expectation that diminishing the Potassium, Sodium and Calcium one-half, would likewise diminish the undesired effects in the same proportion; and perhaps it did so, though the degree of the latter diminution was not as clear as I could wish. As appears to me, these last mentioned compounds were only a little less debilitating, than those previously mentioned, so that finally I very nearly abandoned their use, though not absolutely. When I do use them however, I do not continue them very long, and I conjoin Tonics, Antisbestics, etc. with them. But I would wholly exclude all internal use of the Protiodids and Protobromids of Potassium, Sodium and Calcium, because they exhaust too much, and because they are not at all necessary internally, since we have so many much more eligible compounds. So far as I have tried them, I see little or no objection to their external use on parts not constantly covered by the dress. For other parts there are better preparations of Iodine.

Some of my patients have complained of a Nausiatic power without an Emetic one, in certain Adenagics, which I have been much in the habit of employing. In all probability I have never attached sufficient importance to this, since I have neglected to investigate it. So many persons are Nauseated with the very idea of taking a medicine, that I have usually rested with ascribing the Nausea to this circumstance. I have repeatedly known persons exceedingly fond of Honey Nauseated for hours, by a teaspoonful in a perfectly pure state, but which was supposed to have the Oil of Ricinus mixed with it. As I shall hereafter mention more particularly, there are Adenagics enough, which possess both Nausiatic and Emetic powers in conjunction.

I doubt not that there are many vegetable articles, which are in some degree Leantic, as well as Adenagic; but their administration must always be regulated by the more active power, so that they can be of little or no importance for their Leantic effects, and consequently they are not worthy of enumeration under a group of Leantic Adenagics. A pure Leantic may always be conjoined with a sufficiently active and suitable Adenagic in preference to any article possessing the two powers in conjunction.

I have no knowledge of any vegetable article in which an Adenagic power is conjoined with a Neuragic one. Indeed I know of very few vegetable substances which are Neuragic, and I am not apprised that these are at all Adenagic. But there are many Adenagics of pure chiminal-inorganic origin, which likewise have a Neuragic power.

There are articles in which is conjoined a Narcotic with an Adenagic power; and some of them are highly valuable. But, as a general rule, the Narcotic power predominates over the Adenagic power and thereby prevents its use to a sufficient extent for the latter effect, while for the former, some other article is more eligible. There are exceptions to this rule however, since there are no substitutes for *Digitalis purpurea* and other species, nor for good Extract of *Conium maculatum*.

I am acquainted with a considerable number of Adenagics, which likewise possess an Erethistic power in addition; and many of these articles are highly important in the *materia medica*.

There is a small group of articles commonly believed to possess both Adenagic and Euphrenic powers, and I have known their

Euphrenic power very prominently manifested in certain domesticated brute animals; but yet I never succeeded in witnessing it in the human animal, although I have repeatedly attempted to produce positive Euphrænia in the human subject, by their agency, but always in vain. For these facts I do not know how to account.

There are very numerous articles that possess Adenagic and Oresthetic powers in conjunction. In some the Oresthetic power is so inconsiderable as to be of almost doubtful existence, while in others it is as intense as possible, and there is every gradation between. From this group therefore, an article may be selected of any degree of intensity as respects Oresthetic power, whatever may be the fact as respects Adenagic power. The range as respects the latter is by no means as great as respects the former.

I know of no articles that have an Antisbestic power superadded to an Adenagic one. In fact I consider the Antisbestic as one of the smallest classes in the whole *materia medica*, and those from the vegetable kingdom as very little available for this power merely.

There are certainly a few articles that possess a Tonic power in addition to an Adenagic one; but by no means as many as some seem to believe. A number of articles having merely a Styptic taste (which is commonly called bitter) are therefore associated incorrectly with the Tonic-Adenagics, and thus the list is improperly extended.

There are numerous articles, which have a greater or less degree of Styptic power in addition to an Adenagic one; but no case occurs at present to my recollection, in which I ever saw any benefit rendered by their Stypticity. They usually have only moderate intensity in this respect, so that if a Styptic and an Adenagic should be indicated at one and the same time, scarcely any of them would be found to answer the indications. Upon the whole therefore, I attach no additional importance to this group, on account of the Stypticity. But for the best prescription, it is always necessary to be apprised of all the powers of the article prescribed.

There is a small group of Adenagics that conjoin an Emetic power, without any Cathartic, or any other power; and again there is another small group which conjoin an Erethistic and an Emet-

ic power, also without any Cathartic, or any other power. In strict propriety these ought to constitute two groups; and yet in all ordinary cases, no difference is perceived between them, since it is only when they are pushed to the fullest extent in small doses at short intervals, that there is a manifestation of Erethistic effects. But no accumulation of them in the alimentary canal will cause them to prove Cathartic, quite contrary to the general rule with articles possessing decided and active Emetic power.

There is a very numerous and highly active group of Adenagics that conjoin Emetic and Hydragogue-Cathartic powers, and usually a very considerable amount of direct exhausting power. These articles are in general very great favorites with most of the medical profession, and are very often prescribed (as a sort of specifics) when I could never discover the least indication for any of their effects, as for example, in Rheumatism vera, which is neither a Phlogistica nor a phlogistic or entonic disease, but a pure or unmixed Neurotica. For my part, I have always found them the most difficult articles in the whole materia medica to manage in such a manner as to obtain any benefit from them. In fact I have never been able to manage them so as to obtain the precise degree of Adenagy required, without an undesired and injurious degree of Catharsis, Emesis or exhaustion, or more commonly the whole. On the other hand, they are so precarious and variable in their operation as Emetics or Cathartics, as to be worthy of no reliance for these purposes merely; and the exhaustion, which they produce is always contraindicated,* as they are never prescribed in phlogistic diseases. I once inquired of a professional acquaintance very much in the habit of employing them, how he contrived to get-along with these difficulties. He answered that he always pushed the article so as to produce the effect desired, but paid no regard to any other of the effects—a truly philosophical mode of managing medicines, to which of course, I had nothing to reply. Ever since this conversation, this has appeared to me to be the method of very many physicians—a method of which I never even thought before.

If I could have my choice, I have often thought that I should prefer perfectly pure and at the same time active Adenagics, that I could push to any extent required, without any other operations or effects. If Narcosis, Catharsis or Emesis should be indicated

at the same time, I would produce these effects by pure Narcotics, Cathartics or Emetics. So far as the Emetics or Cathartics are concerned, this method strictly is practicable, but no farther. Unfortunately the pure Adenagics are rather feeble articles; and though there are numerous pure Narcotics, that are highly active, yet generally these are not of the right character for conjunction with the Adenagics. However, this difficulty is not a serious one, since Papaver is the Narcotic most commonly required under such circumstances—an article that may usually be pushed to any extent needed without inconvenient effects.

Some Adenagics possess only a single additional power, while others possess two or more; and there are many which possess four or five. All the different and distinct powers, that are ever possessed by any of the Adenagics are Antiphlogistic, or exhausting in a less degree, Nausiatic, Neuragic, Narcotic, Erethistic, Euphrenic, Oresthetic, Tonic, Styptic, Ecboic, Emetic and Cathartic. But though the Adenagics do not answer any useful purpose, in cases in which there is considerable exhaustion, neither are they any more serviceable in phlogistic or entonic cases. Phlogistic or entonic Phlogotica do not seem either to require or to tolerate Adenagics. Antiphlogistication is all that is necessary or useful, till the phlogistic or entonic diathesis is obviated. It is true I never tried them myself in such diseases; but I have received abundant testimony of their inutility, from professional friends who had tried them thoroughly, and who came to the result that none of them ever prove beneficial in such diseases, and that many of them aggravate, and thus do injury. For the useful operation of Adenagics, the system must be within a certain range, between the tone of health and no great atony, since positive entony on the one hand, and considerable atony on the other, equally contraindicate them. Probably much the largest portion of the atonic Phlogotica and Dysthetica, in their early and middle stages, are within this range, unless they have been reduced below it by injudicious exhausting measures. I have frequently had occasion to make the observation that Depletion of Blood, immediately previous to entering upon the use of an Adenagic, almost invariably prevents it from producing any useful effect. I do not think that there are any cases in which Depletion of Blood and Adenagics are indicated together or in immediate succession, with

one or two exceptions. In the entonic or phlogistic Phlegmonous Phlogotica the Disoxyd and Dichlorid of Mercury are useful after the phlogistic diathesis has been perfectly obviated by Depletion of Blood; and in entonic or phlogistic Phlegmonous Pneumonitis, after sufficient Depletion of Blood, certain other Adenagics beside the Mercurials just mentioned, are often useful as Blennagogues. Depletion of Blood in the atonic Phlogotica, either to obviate plethora, or to diminish the moles movenda, in order to adapt it better to the force of the vis movens will always frustrate the operation of an Adenagic. If this were the proper place for it, I doubt not that it might be easily shown that there is no such pathological condition as plethora; and that Depletion of Blood in all atonic cases always diminishes the force of the vis movens much more in proportion than it lessens the moles movenda. In many atonic cases where Adenagics are indicated, many will employ Depletion of Blood to obviate some congestion before entering upon the Adenagic, but this is a great error. There are in fact several quite different sorts of congestion requiring very different treatment. Now that congestion which is accompanied with an atonic condition of the system is never benefited by Depletion of Blood; and this process under such circumstances, interferes as much with the favorable operation of Adenagics as under any circumstances whatever. It is never true that Depletion of Blood in an inappropriate case ever increases susceptibility to the operation of an appropriate remedy; but on the contrary, it always renders the disease more difficult of cure. For example, Depletion of Blood is never remedial of Intermittent; and if it is employed, it will render the case more difficult of cure, so as to require a considerably larger quantity of Cinchona within a shorter time, in order to arrest the paroxysms, and a longer continuance of it to prevent their recurrence. I think I have often known a total failure, as respects the favorable remedial operation of the Adenagics, from injudicious Depletion of Blood, because the patient will bear it (as the common phrase among physicians too often is) or to increase susceptibility and prepare for the Adenagic (as is often said) than from any other cause or causes in conjunction. At the present period, atony is far more frequently the cause of a failure as respects obtaining the best remedial effects of the Adenagics than is commonly imagined. I have of-

ten been consulted by professional acquaintance in regard to the most proper and best manner of administering and managing what I call Adenagics, on which I have given the preceding directions. On subsequent inquiry however, I have very often found that they had intirely failed of accomplishing any thing with them; and in about nine cases out of ten, the reason has proved to be that they obstinately persisted in preceding them with Depletion of Blood. This practice however, has been less frequent, every year for many years past.

The Cathartic and Emetic Adenagics are perhaps the most liable to produce undesired effects of any group of the class. But I have been in the habit of witnessing the most injury from employing a Cathartic-Adenagic where Catharsis is contraindicated. From the fact that Catharsis was so universally beneficial in one or more stages of the diseases that prevailed before the last change of the diathesis of acute diseases from entonic or phlogistic to atonic, which took place in different parts of the country some where between the year 1805 or 6 and 1812, physicians found it difficult to abandon this process to the extent that the character of the diseases really required; and even to the present time, when in consultation, I oftener witness inconvenient and injurious effects from injudicious Catharsis than from any other measure or agent; and in the selection of an Adenagic, it does not seem to be deemed of any importance that it can not be employed so as to obtain the desired degree of Adenagic operation without Catharsis, and that too of a Hydragogue character. I have very often been called in consultation to advise in regard to the relief of distressing symptoms, which I considered as unequivocally and certainly the result of Catharsis, of which however, I could not persuade the physician in attendance. He would allow me, at the time, to administer Papaver enough for present relief; but in about twenty four hours, would insist on suspending the Papaver and repeating the Cathartic process. This would reproduce the distressing symptoms, and again require special doses of Papaver. The repetition of the same process with the same effects, for three or four times, I have often known to fail intirely of convincing the prescriber.

I consider it as quite certain that the diseases of the present period require very little Catharsis. Even where they seem to tol-

erate this measure, they are generally injured by it, in the event, if not immediately. Even when a patient actually needs an Adenagic and a moderate Cathartic operation, I greatly prefer employing a Non-Cathartic-Adenagic and a pure Cathartic, which are distinct articles, to the exhibition of a Cathartic-Adenagic. If I use the latter, it will very often happen that the patient will be unable to take enough to obtain the necessary degree of Adenagy without too much Catharsis; but when we depend upon different articles for these two effects, we can give each in just such quantity as to produce exactly the desired degree of the effect of each. I believe that all the Cathartic-Adenagics are Hydragogues when they are suffered to prove Cathartic. At any rate, this is the fact with all, with which I am familiar. This constitutes a serious objection to them as Cathartics, at least in ordinary cases.

The fact that so many different and distinct powers may be associated with an Adenagic power, affords the strongest ground for discrimination in the choice of an article of this class for a particular case of disease. The different degrees of rapidity and energy with which different Adenagics operate, should always be taken into consideration in the selection of a particular Adenagic, for any particular case of disease. Although a pure and unmixed Adenagic operation is neither an exhausting nor an invigorating operation, yet it is seldom expedient or useful to employ Adenagics in very atonic cases. When there is great atony they commonly fail of producing Adenagy; but if they do not, Adenagy fails of rendering any benefit, and usually is of most palpable disservice. I had good cause to suspect this early in my professional career, and so doing, I made such trials as soon verified my suspicions. Since that time, I have very often seen Adenagics employed by others, in the stage of exhaustion of numerous atonic-acute diseases—Pyrectica, Phlogotica, Exanthematica—and in all stages of malignant diseases—and nearly always with the ill effects that I long ago learned they were liable to occasion. On pointing out these effects to the physicians in attendance, it has always been insisted that they were regular symptoms of the disease, as they had always been in the habit of witnessing them in such cases. It was in vain to urge that they always had been in the habit of employing the same Adenagics, in all such cases, and of course ought to have witnessed them, as the effect of the

Adenagics, if I was right about their cause. Such opportunities of witnessing this sort of practice, so long after I ceased to employ it myself, have afforded me an amount of evidence on the subject, that could not have been obtained in any other way—evidence, it is true, obtained at the expense of the patient; but which it was not in my power to prevent, since, as appears to me, there is not a subject on which the great body of physicians are so slow to appreciate absolute proof, and so obstinate in the maintainance of an indefensible and unsound opinion.

But beside this, there are few Adenagics, that do not possess some other power or powers in addition; and such power or powers, in a very great majority of cases, are injurious in diseases or stages of disease attended with considerable exhaustion. Some of the Adenagics possess such a degree of direct exhausting power as to be positively Antiphlogistic, and some, though not sufficiently exhausting to be truly Antiphlogistic, are never the less sufficiently so, to do considerable mischief in all cases in which the production of exhaustion in any degree is decidedly contraindicated. No considerable time passes without my witnessing cases of Struma, that have been greatly injured by exhausting Adenagics, and some times irretrievably. There are however, other powers, beside a direct exhausting one, possessed by numerous Adenagics, that are injurious in all cases of considerable exhaustion, which are much too often disregarded in the common prescription of the Adenagics. But I have else where insisted that the physician should have exact knowledge of every power possessed by all the articles that he prescribes; and that it is not sufficient that one power merely should be indicated; but he should take care that no power that happens to be conjoined, is contraindicated.

The Adenagics require some diversities of management in acute, in comparison with chronic diseases. In an acute disease they should be given much more efficiently, and their use need not be continued for near as long a time as may be necessary in a chronic disease. In an acute disease, a larger quantity of almost every Adenagic will be required in a given time, to produce the same degree of operative effect, than would be necessary in a chronic case. In an acute disease, the Adenagic will accomplish all that it is capable of accomplishing in a comparatively short

time, after which it should be discontinued, and some agent of a different character substituted for it. However, even in an acute disease, the Adenagic is not to be discontinued intirely, immediately on the disappearance of the morbid condition for which it was employed, because under such circumstances the morbid condition would be liable to return again, after a longer or shorter time; but it should be continued for some little time afterwards, usually in a diminished quantity, till the predisposition to the morbid condition, that the Adenagic is intended to relieve, is obviated. As a general rule, in order to obtain the best remedial effects of the Adenagics in acute diseases, they should be pushed till they produce a greater or less degree of their regular operative effects. It is true we some times succede in curing disease without producing such effects, at least obviously, but we often fail. If this precept is well founded, it will be evident how important it must be for the practitioner to make himself familiar with all the operations of each individual Adenagic, which he ever expects to employ in his practice. In short, the Adenagics require the same management in this respect, in all the acute diseases to which they are appropriate, that Cinchona requires in Intermittent. It is well known as a general rule, that Cinchona when employed in Intermittent must not be suspended immediately on the interruption of the paroxysms of the disease, because by that method of management the paroxysms, in many instances, would return again; but in order to effect a permanent cure, it must be continued so long after the interruption of the paroxysms as to obviate intirely all predisposition to them.

In chronic diseases, the Adenagic is not to be employed with near as much freedom as in the acute, because in the first place chronic diseases do not generally occupy the system by any means as powerfully as the acute, and therefore the patient is usually more susceptible to the influence of such remedies as the Adenagics; and because, in the second place, chronic diseases always yield much more slowly than the acute, and therefore the remedies must necessarily be continued much longer, on which account it will be obvious that a patient might not be able to tolerate for any length of time, that degree of operative effect from a given remedy, which might be useful and perhaps necessary to effect a cure in an acute disease. It should be an invariable rule

never to produce such a degree of the operative effects of any remedy, in a chronic disease as will be liable to preclude the continuance of its use for the required length of time. Acute diseases may often be taken by storm, but chronic ones never can be, at least with safety; they must always undergo a regular siege. But even in chronic diseases, the Adenagics should be pushed so far as to produce some perceptible degree of their operative effects, otherwise we can never know when the system is sufficiently under their influence to have them render any service. Without some such test, a given Adenagic might be employed even for a long time to no purpose, without any evidence that a larger quantity might not cure the disease. As a chronic disease usually yields slowly and gradually, it is much less necessary to continue the use of an Adenagic for some time after an apparent cure of the complaint. In fact, when a chronic disease appears to be gone, it is really so. But to this there are some exceptions, as for example, some cases of very much protracted cutaneous affections. These will some times be cured to all appearance wholly, but return again in a short time after the suspension of the use of the remedy, at least in a moderate degree, and this several times in succession. Under these circumstances, it is necessary to resume the remedy for a short period. In one case I was obliged to continue the remedy for a twelve-month, with the result of a complete cure. From these facts it will be readily understood how important it must be to employ the medicine, in such doses and quantities as will permit its long continuance.

Can a mere and pure Adenagic operation be exerted in such a degree as to constitute noxious, deleterious, poisonous, or in one word, dangerous effects; and can it be made to extinguish life? This question is not as easily answered as might at first view be imagined. The simple and pure Adenagics are in general feeble articles; while the more active ones have other powers conjoined, of such a character and in such a degree, as to prevent our distinguishing the exhaustion of the one, from that of the other. After much attention to the subject and long investigation, I have at last come to the conclusion that there is such a thing as Ultimate-Adenagy; i. e. Adenagic effects beyond the medicinal grade, which if produced with sufficient intensity, and continued long enough, may prove injurious, dangerous, or even fatal. But

I do not know that I can show this conclusively to others, though I think that I can. I commenced the investigation of this subject as long ago as 1812; but so much observation was necessary that I did not arrive at satisfactory results till about 1846, since which time all my experience has served to confirm my previous conclusions, so that I am now prepared to decide much more confidently on the correctness of my views, than ever before. Within the last ten years I have witnessed so many facts that throw light upon this subject, that for myself, I can no longer have any doubts in regard to it. I am now well satisfied that there is such a thing as Ultimate-Adenagy—a degree of the operation of an Adenagic power, not only beyond a medicinal grade, but amounting to a noxious grade—a grade some times fatal. Perhaps this grade of effect is of much more frequent occurrence than I have hitherto supposed or suspected. Since I have settled in what Ultimate Adenagy consists, I have recognized it much oftener. I now think that I formerly witnessed it in many instances, in which I had no suspicion of its true character.

I have long been satisfied that certain of the most active of the Adenagics, when given in excessive quantities and continued for an excessive length of time (both of which, as I am aware, are merely relative) are liable to occasion a great loss of tone in the whole alimentary canal, accompanied by great morbid irritability, not only of the stomach but also of the intestines, and with a copious secretion of Porraceous-green matter, not infrequently followed by extreme exhaustion of all the parts dependent upon the nerve of chymical action, nutrition and reproduction, and the powers of the voluntary muscular system; the senses, and the mental or intellectual faculties remaining in a comparatively good condition; all these symptoms, in many instances, being followed by speedy death. The articles that operate the most powerfully in this manner, possess the power of proving Hydragogue-Cathartic and Emetic; but I never knew either of these operations to take place in any fatal case, till there had been a decisive and irremediable sinking of the patient. Other articles a little less active as Adenagics, possess only an Emetic power; but even this is not exerted, till after the fatal sinking. The fatal effects are therefore not occasioned either by Hypercatharsis or Hyperemesis. In many instances, both of these occur so late, as not to constitute even an

aggravating agency. All of these dangerous Adenagics possess no known and recognized exhausting power except those of a Cathartic and Emetic. What can all this be but Ultimate Adenagy? It is certainly produced by the most active Adenagics in the whole *materia medica*, and usually after the exertion of this power in a decisive degree.

By some physicians this set of symptoms is hypothetically ascribed to Phlogosis of the stomach and intestines, but of what species is not stated. Now I have seen several such cases, and I can say confidently, that there were no symptoms of Phlogosis before death, but rather the very opposite; and also that post-obit examination of a part of them, detected no such symptoms. Not only before, but after dissolution, there was every indication of death from simple, pure and direct exhaustion merely. By another set of physicians, the fatal event in such cases is ascribed to irritation; but what does irritation mean, in such circumstances? Towards the end of life, the patient often has jactitation; but this does not prove irritation, in any sense which I have been in the habit of attaching to this term. I have often seen persons die from direct and rapidly progressive exhaustion, leaving no traces behind; and they died in this same manner.

If what I have been in the habit of considering as Ultimate Adenagy, is really and truly such, its symptoms are as follow, viz. Grade 1. Anorexia and deficiency of digestive power, and even positive loathing of all food. Grade 2. Absolute intolerance of the stomach for food and medicine generally, with frequent vomiting. Grade 3. Epigastric sinking, with various other uneasiness and indeed distressing symptoms, commonly referred to the region of the stomach, or at least of the epigastrium. Grade 4. Excessive secretions from the mucous follicles, commonly of a green color, and perhaps from other organs. Grade 5. Diarrhœa always peculiarly indomitable and obstinate, and some times colliquative. Grade 6. If the case happens to be sufficiently protracted, there will often be an Icteric discoloration of the eyes and skin, and of all the excretions, some times even of the intestinal discharges. Grade 7. Greater or less atony, i. e. deficiency of vital energy and strength of action in the sanguiferous system, and probably in all the parts dependent upon the nerve of chymical action, nutrition and reproduction. This atony is

some times sudden in its access and extreme in degree; while at others, it is gradually progressive, and more moderate in degree. Grade 8. Often a great deal of general uneasiness, restlessness and jactitation. Grade 9. Which some times terminates in death. All of these symptoms do not occur in every instance, which I have supposed to be Ultimate Adenagy; for some times one set and some times another is absent. I have however, often seen the whole in conjunction in particular cases. Neither are these all the symptoms that ever occur in all possible cases; but they are the principal—the most important.

As Ultimate Adenagy is a new subject, and this the proper place to treat of it, I shall not only describe it generally, but shall mention several of the individual articles which produce it in the most prominent degree. I have repeatedly been called (some times to take the exclusive charge of a case, that had been under the treatment by a homeöpathist, and some times as a counsellor merely) and found the patient affected with what I have been for some time in the habit of considering as Ultimate Adenagy. The diseases for which these patients were treated by the homeöpathists, were all chronic and of such a character as to be attended with no sort of danger. The most common was Rheumatalgia vera, v. chronica, in some of the muscles of the extremities. The patients had been under treatment by a homeöpathist for two months at least, and occasionally more. On the supervention of some of the symptoms that I am inclined to consider as Ultimate Adenagy, the homeöpathist had been dismissed, and some other physician had been called. I never knew one of the worst of these cases recover, especially when the whole of the symptoms that I consider as Ultimate Adenagy existed. The general exhaustion resisted a considerable amount of Brandy, and all other Antisbestics; and of course Quinine and all other Tonics. No amount of Papaver seemed capable of restraining the Diarrhoea in the least, and hardly of producing any other of the effects of this agent. I have known four-sixths of a grain of Sulphate of Oxyd of Morphinum given every fifteen minutes, to no purpose whatever; and under all this, I do not think that any physician, not knowing the treatment, would have supposed that the patient was taking any Papaver at all. In short, no effects seemed to be produced by any medicine, of any character, that I ever saw tried.

I hardly need say, that all cases of this degree of intensity, invariably died; and also most cases of considerably less intensity. I have known only a few comparatively slight cases saved.

It will naturally be inquired, what was the Adenagic medicine, that produced such effects? To this I am obliged to answer that I do not know, though in every case that I have seen, from a dozen to twenty doses remained with the patient, when I was called. It was always a light cream colored powder, apparently of some root. I have repeatedly weighed the doses, and as near as I now remember, found them about a grain. At the time, I made record of the quantity, but I have not access to that record at present. These doses were some times repeated only three times a day, and some times four. I am quite sure that the article whose effects I have described, was always the same. The first time I saw it, I suspected it to be the bulb of *Colchicum autumnale*, but on tasting it, I could not perceive the least acrimony, but only a very slightly sweetish and farinaceous taste. After the best examination I could make, the suspicion that it must be the root of *Euphorbia Ipecacuanhæ* (*Linn.*) preponderated. When Dr. William P. C. Barton first commended to the physicians of the U. S. A. *Euphorbia Ipecacuanhæ*, as an integral substitute for *Cephaelis Ipecacuanha*, I immediately procured it, and made what I supposed to be a fair and thorough trial of it. In my hands, though it always nauseated a great deal and vomited a little, it proved utterly worthless as an Emetic; but it was always much more Cathartic than was desired or beneficial. Finding it so certainly Cathartic, I tried the employment of it in very small doses and intirely short of the nauseating point, as an eccoprotic in habitual Coprostasis. In every instance, which occurred for a considerable time, it readily proved eccoprotic for a short period, but soon it greatly impaired the tone of the whole alimentary canal, destroying appetite and digestive power, and sooner or later, occasioning an insidious but colliquative Diarrhœa, that I found the greatest difficulty in restraining. In one instance it produced an Icteric discoloration of the skin, while the Diarrhœa was the most urgent, and before I had succeeded in controlling it at all. In the first cases in which I employed it, I supposed that these effects were due to some thing else; but I soon found that this was a mistake; and accordingly I ceased to prescribe it, as uni-

formly, its undesired effects greatly predominated over those which I desired. During my observations upon it, I came to the conclusion that it was an Adenagic analogous in its ultimate effects at least, to *Colchicum autumnale*. Subsequent, to the termination of my trials of this article, a medical gentleman of regular education (as common language is, and of course a graduate in medicine) applied to me in a very private manner, for the natural history name of this plant; but he was particularly desirous that I should keep his application a most profound secret. He was very careful that I should not have the smallest inkling of his object or purpose, and warned me before hand to ask no questions, to which I am sure I was no way inclined. I subsequently learned that he supposed that in this article he had discovered a perfect specific for Dysentery, and intended to obtain a patent for the exclusive proprietorship of it. For a patent he had learned the necessity of a natural history name, and after some time ventured to inquire after one. A little time afterwards, he died at the house of a patient, from which he was unable to get away, of an attack of Dysentery of about three days' duration, not only with the medicine in his pocket, but under its use. I have seen very few serious, and much more intense cases of Dysentery, that an efficient use of this article would not have rendered speedily fatal. It must be observed that specimens of this root may be found, which, from various causes, are nearly or quite inert. I mention this fact to explain some discrepancies of result from the use of this article, of which I have been informed.

I have already mentioned the great exhausting power of *Colchicum-autumnale*. If this is not a part of its Ultimate-Adenagic operation, then I do not know what it is. At all events, this article, if used too freely, or continued too long, will produce the whole aggregate of effects, which I have been in the habit of considering, and have just described as Ultimate-Adenagy. If I am right as to what constitutes Ultimate-Adenagy, this agent is more liable to produce it than any other article of the *materia medica*, unless it may possibly be *Euphorbia Ipecacuanhæ*; and perhaps this is not an exception.

At one time, it was customary for physicians to say that the several species of *Veratrum*, which are used in medicine, produced the same identical effects, in kind if not in degree, as *Colchi-*

cum autumnale. This opinion, (so far as I know) was not founded upon any actual observation of the effects of any species of Veratrum, but upon the hypothesis that the Alcaloid commonly called Veratrine, is the active principle, not only of Colchicum autumnale, but also of all the medicinal species of Veratrum. But I believe that it is now ascertained that Colchicum autumnale contains no Veratrine (so called) but a different Alcaloid, viz. Colchicine. In addition to this (at least so far as I know) I am not apprised that there is the least evidence that what is called Veratrine is contained in a single species of Veratrum. All the specimens of Veratrum album found in any shops, where I have practiced medicine, have, on trial, proved to be inert. What I have seen has always been in powder, and has been acknowledged to be many years old, how old was intirely unknown.

From the best testimony upon the subject, I can not doubt that Veratrum album is both Erethistic and Adenagic, though the testimony goes to show merely that it is Hydragogue-Cathartic and Emetic. This is not incompatible with the hypothesis that its active principle is the Alcaloid Veratrine, but has this Alcaloid ever been obtained from it? So far as I am informed, the Veratrine of the shops is produced from a species of another, but nearly allied genus, though once supposed to be obtained exclusively from Veratrum Sabadilla, which is now ascertained to be a mistake. As the plant which affords Veratrine, affords also another Alcaloid, and perhaps more, not supposed to be contained in any species of Veratrum, I think we may well doubt whether Veratrine (unfortunately so named) is contained in any species of Veratrum. Indeed, a distinguished author says, "the true nature of the Alcaloid contained in Veratrum album, is still unknown; so that the Veratrine of commerce may be considered as being obtained intirely from another article." (*Pg. 8 Turnb. on Medic. Prop. Nat. Ord. Ranunculaceæ, Lond. 1835.*) It is likewise often said by authors that Veratrine (so called) is the active principle of Veratrum viride. This can not be the fact, if this Alcaloid is at all Cathartic, for I have long employed this species (certainly ever since 1812) and I never yet witnessed any grade of Cathartic operation from it. Those gentlemen, who are in the habit of always pushing it to active vomiting, I should think may

know more about this group of effects than I do. In general, the operation of *Veratrum viride* is very like that of *Sanguinaria vernalis*, except that it is more active. I should think therefore, that the Ultimate-Adenagy of the two articles might have a strong resemblance.

I make all this statement to show that what has so often been claimed as to the identity of the powers, operations and effects of *Colchicum autumnale*, and *Veratrum album* and *Veratrum viride*, does not rest on good evidence (so far as I am able to ascertain) but is founded only on conjecture or hypothesis. I have always been inclined to think that *Veratrum Lobelianum* (*Bernhardi*) would yet be found to be medicinally analogous to *Veratrum album* (*Linn.*) and *Veratrum Eschscholtzii* (*A. Gray*) analogous to *Veratrum viride* (*Aiton*); but of this I have no actual knowledge.

I have seen the same Ultimate-Adenagy in kind, though by no means in degree, and with comparatively little exhaustion from *Sanguinaria vernalis*. I first witnessed this, in my own practice, in the early part of my professional career, from too long a continuance of a free use of this agent, when employed for the production of a direct resolution of a certain atonic Phlogotica, as for example, Pneumonitis Typhodes-notha, i. e. Dysenteric Phlogosis of the bronchial membrane, the constitutional febrile affection being a Typhus nervosus. I learned at once to recognize its approach, and to avoid it wholly, by suspending the use of the medicine entirely. Ultimate-Adenagy, I believe, is never produced by this article, till the resolution is effected, at least whenever the case is a proper one, in which to attempt such a thing. However, I have often been associated with physicians, in the treatment of this disease, whom I could not persuade to abstract the medicine in proper time, but who would insist upon continuing it, till full Ultimate-Adenagy took place. Though I never witnessed it but twice, in my own practice, yet I have had opportunity to see it much too frequently, under the circumstances just specified. I never yet saw any thing like dangerous Ultimate-Adenagy from *Sanguinaria vernalis*—never had the least reason to suspect its ever producing death in this manner; and yet, if the article should be injudiciously pushed after producing such effects as I have seen, I can easily believe that it might prove fatal. *Sanguinaria*

produces other ultimate effects beside Ultimate-Adenagy, viz. Ultimate-Erethism; but I never saw any danger from the latter.

I have repeatedly seen in consultation, (never in my own practice) a group of effects produced by an inordinate quantity of *Lobelia inflata*, which were very like them that I have just described, except that there was much greater nausea. I should have no sort of hesitation in referring these wholly to Ultimate Adenagy, had I not witnessed very much the same symptoms from an inordinate quantity of Tartrate of Antimonia and Potassa, and from an inordinate quantity of *Cephaëlis Ipecacuanha*, and even from extreme Nausea produced by the motion of a ship propelled by sails, and a Post-Coach so hung upon its springs as to have the same sort of motion. The effects to which I refer, are those which have been called Narcotic-Poisoning, when occurring under treatment by Thomsonians. The latter, they can not be, because they are in no respect like Narcosis, and because *Lobelia inflata* is in no degree Narcotic, as I am well prepared to show.

Now it is my present belief that the same or similar effects are produced by various articles, much oftener in the practice of those who are called regular physicians, than in that of those who are called Thomsonians. I now think that in all probability, the symptoms in question are partly due to extreme and protracted Nausea, and partly to Ultimate-Adenagy. I am sure however, that neither Tartrate of Antimonia and Potassa, nor *Cephaëlis Ipecacuanha*, are at all Adenagic, because, for reasons which it is not necessary to mention here, I have taken greater pains to ascertain Adenagic powers in them, than in any other agents in the whole materia medica. But as this subject is important in connexion with *Lobelia inflata* (a valuable article which has been in use in Connecticut, and I believe also in Massachusetts, for more than a hundred years, till the Thomsonians brought it into discredit) I shall treat further of it in my proëm to the class Emetica. But whatever the condition under consideration may be, I can easily understand that if the medicine is pushed after it is fully produced, death may be the consequence. I think it quite possible that in this manner the Thomsonians may some times destroy life. Such a degree of these symptoms as I have happend to witness from *Lobelia inflata*, has always been readily and speedily relieved by *Papaver* and *Alcohol*.

I have often seen what I call Ultimate-Adenagy from *Urginea maritima*, and from *Polygala Senega*, as intense in all respects, as I ever witnessed from *Lobelia inflata*, *Sanguinaria vernalis*, &c. Indeed the general exhaustion resulting from the first two articles was greater than I ever saw from the last two. The Ultimate-Adenagy of *Urginea maritima* and *Polygala Senega*, commonly leaves sequels behind it, that require time, and often a comparatively long course of Tonics to remove, which I have not observed to be the fact with the Ultimate-Adenagy, either of *Sanguinaria vernalis* or *Lobelia inflata*. This I suppose is owing to the fact that these former articles possess a considerably greater degree of exhausting power than the latter. Indeed I do not know that the latter possess any degree at all of such a power.

Very many times, I have seen in consultation quite an intense degree of Ultimate-Adenagy from the Dichlorid of Mercury. Among those who make all their patients breakfast, dine and sup upon this agent, I have good reason to know that its Ultimate Adenagy is very common. I now well recollect a case of it, in a patient under the charge of a young physician not educated in New England, in which an old practitioner of nearly eighty years of age, and myself, were called in consultation, by the family, on the occurrence of the symptoms in question. The old practitioner had never witnessed any such effects; and on being asked by the family, what they were, though by no means a profane man, he answered, he did not know what the devil they were. The same question was put to me, but I evaded a direct answer. After the departure of the old physician, the gentleman in attendance expressed some contempt for the ignorance of the senior counsellor, because he did not know what the symptoms were. He declared they were just what he wished to produce, but supposed that nobody educated in New England would venture to push the medicine so far as to occasion such effects; but he did not enlighten the family any more than I did, because (as I suppose) he was sensible that they were much alarmed. He was rather reluctant to allow me to give *Papaver* enough to meet the symptoms which seemed to indicate it. But the family were so fully persuaded that what alarmed them was the effect of the treatment that they never employed the young man again, though previously much prepossessed in his favor. The fact that these

same effects occurred several other times in the practice of this same gentleman, and more especially that he employed other measures, in regard to which there was considerable popular apprehension, finally prevented his obtaining the confidence of the public. Now I have been acquainted in parts of our country where these effects would have been expected as a matter of course, and where the ability of the physician would have been strongly suspected, if he had not produced them. The truth was that, at the time this case occurred, there was a set of diseases prevalent that did not tolerate such measures at all (which this gentleman did not know) and besides, the people had not been accustomed to them, which in their view was quite as important.

In a few instances, a moderate degree of Ultimate-Adenagy has occurred in my own practice, from the Dichlorid of Mercury; but it has always been so inconsiderable as to cause no alarm among the friends of the patients. It was undoubtedly from the use of this medicine in an inappropriate case; but it was always speedily relieved by Papaver and Alcohol. I have heard it maintained that the production of this aggregate of symptoms is always necessary to the best effects of this agent; but I doubt not that this is a most egregious error. Is not what has been called Mercurial Erethism a true and proper Ultimate Adenagy of Mercury? So far as my present recollection serves in regard to what has been so inappropriately called Mercurial Erethism, that condition is only extreme Ultimate Adenagy from some compound of this element. Mr. Pearson is said to describe what he calls Mercurial Erethism as follows, viz. he says that "it is characterized by great depression" (exhaustion doubtless) "of strength; anxiety about the præcordia;" (q? the region anterior to the heart, or the epigastrium, for this term is used in both these senses?) "frequent sighing; trembling; a small quick, some times intermitting pulse; a sense of coldness; but the tongue is seldom furred; nor are the vital and natural functions much disturbed." "In this state any sudden exertion will some times prove fatal." (*See Hoop. Lex. Med. title page, 4th Amer. Ed. N. Y. 1829, Sam. Akerly, M. D. Editor.*)

This requires some comment. In the first place, Mr. Pearson says that Erethism is "increased sensibility and irritability." though he admits that the term "is variously applied by autho

I have already given my understanding of this term, and though no author may have defined it just as I have, yet most of them seem to apply it very much as I have done. Certainly what Mr. Pearson has described as Erethism is some thing more than "increased sensibility and irritability." Under such a condition merely, patients do not have such symptoms as Mr. Pearson specifies, nor do they die suddenly on a little exertion. According to Hooper's Dictionary, Mr. Pearson says that his supposed Erethism "is characterized by great depression," and then he goes on to describe great exhaustion instead. But I suppose that this is a part of the delicate language of the present day, which calls exhaustion, depression, oppression or prostration, instead of what it really is, through fear of frightening people, and then such misnomer leads to the practice which the erroneous nomenclature requires. Such erroneous denominations have slain their thousands. Mr. Pearson says that in his supposed "Mercurial Erethism" the "vital functions" are not "much disturbed." In this I wholly and intirely differ with him. As appears to me, every symptom which he has mentioned, indicates extreme exhaustion of the vital powers of the vital organs, and especially the fact that "in this state, any sudden exertion will some times" (I should say generally) "prove fatal." But has Mr. Pearson specified all the symptoms that occur in his supposed "Mercurial Erethism"? I have seen all which he mentions; but they were accompanied with several others, such as anorexia, amounting to perfect loathing; absolute intolerance of food, and all medicine that I ever saw employed except Papaver and Alcohol; excessive and vitiated secretions from the mucous follicles; and in some instances, nearly all of the symptoms which I have described as constituting Ultimate-Adenagy.

I believe that Papaver and Alcohol are the two best remedies for Ultimate-Adenagy; but cases of this condition, as produced by different Adenagic articles, even when seemingly of about the same intensity, in reality vary very greatly as respects curability. That produced by *Colchicum autumnale* is the most unmanageable of any form that I have ever witnessed. Next in this respect, is that which I suppose (but do not know certainly) to be produced by *Euphorbia Ipecacuanhæ*. That produced by Dichlorid of Mercury is much more relievable in proportion to

its intensity than either of the preceding, though till it is actually relieved, a little over-exertion is liable to prove suddenly fatal.

The Adenagics undoubtedly exert their principal operation upon that part of the involuntary motor nerve of chymical action, nutrition and reproduction, which is sent to the secernents and absorbents, or in other words, the glandular system. When pushed however, so as to occasion Ultimate-Adenagy, they affect the whole of this nerve, and that quite powerfully. The essence of the operation of the Adenagics seems to be the regulation of the activity (but more especially its increase when deficient) of secretion and absorption. The Adenagics also generally change the quality of these actions; but when pure, they neither increase nor diminish power nor strength of action, except when pushed to the production of their ultimate effects; and then they occasion a greater or less degree of exhaustion.

I have said that the Adenagics generally change the quality of the action of the secernents and absorbents, and of course the quality of their secretions. This they commonly do only when these actions and secretions are vitiated. When they are perfectly healthful, both in quality and quantity, the Adenagics only increase their amount. When pushed to the production of Ultimate-Adenagy however, their operation is quite different. All those pure Adenagics that are not sufficiently active to be capable of producing Ultimate-Adenagy, are probably incapable of destroying life; but all those which produce this state or condition, are undoubtedly capable of destroying life, and they accomplish this by the production of extreme exhaustion in all the parts of the involuntary motor nerve of chymical action, nutrition and reproduction. It must be observed that all those articles which possess a strong exhausting power, intirely independent of an Adenagic power, may destroy life by the production of a sufficient degree of exhaustion, without any Ultimate-Adenagy.

So far as the Adenagics of vegetable organic origin have been sufficiently examined, they depend for their activity upon one or more of their proximate principles, which are either Alcaloids, i. e. compound radicals of H. C. N. alcalized, or at least combined with Oxygen; or they are basic Oxyds of compound radicals of H. C. There are many instances in which nearly allied species

of the same genus contain the same active, proximate principle; and there are even some instances in which the species of nearly allied genera contain the same. There are several nearly allied species of the genus *Strychnos*, which contain the Alcaloid *Strychnina* or *Strychnine*. These may be used as substitutes for each other in medicine. A single species of *Ignatia*, a genus nearly allied to *Strychnos*, contains *Strychnine*, so that it may be used indiscriminately with *Strychnos Nux-vomica* and other medicinally similar species. In all such cases, the detection by chemistry of an already known active proximate principle, in a predominating quantity, in a new and previously unknown article, is decisive as respects its medicinal powers; and if the proportion in which it exists is accurately ascertained, and is in a good degree uniform, it even decides its ordinary dose! When a given article contains two or more proximate principles, these principles usually have a general agreement as respects their power or powers; but each usually has its peculiarities, and they commonly vary very greatly as respects the degree of their power. Besides *Strychnine*, *Strychnos Nux-Vomica* contains a large amount of another Alcaloid named *Vomicine*. This substance has medicinal powers similar to *Strychnine*, but a larger dose is required to produce the same amount of effect. It is said (but how truly I know not) that all the species of *Strychnos* which contain *Strychnine*, contain also *Vomicine*. It is said that *Ignatia amara* also contains *Vomicine* as well as *Strychnine*. There are some instances in which species of the same genus contain active proximate principles differing widely in their powers, operations and effects. There is one species of *Strychnos* at least, that contains the Alcaloid *Curarina* or *Curarine*, and quite probably more. Now *Curarine* has no medicinal power in common with *Strychnine*, though it is full as active, and perhaps even more so, but in an entirely different manner. *Rouhamon Guianense* and *Rouhamon Curare*, two species of a genus nearly allied to *Strychnos*, are believed to contain the same Alcaloid *Curarine*, so that these species and *Strychnos toxifera* may be used indiscriminately. There is one species of *Strychnos*, which is medicinally active, but in such a manner as to preclude its containing either *Strychnine*, *Vomicine* or *Curarine*. I allude to *Strychnos Pseudo-Quina*. This is about all that chemistry can do toward assisting to a knowl-

edge of the powers of new and previously unknown articles.

The preceding illustrations are made from rather a feeble Adenagic, and one that possesses other powers in a more prominent degree; but it was chosen because the whole of them could be exemplified by it. I know of no other individual article that would have furnished examples of the whole.

So far as the inorganic Adenagics are concerned, the following seem to be laws as respect their active principles. Certain elements are Adenagic per se, as Chlorine, Bromine, Iodine, Sulphurum, Aurum, Platinum, etc. and they retain this power in all their combinations, perhaps with the exception of some very complex one. Certain elements which are not medicinal per se, always impart Adenagic power to their compounds, with the exception perhaps of some exceedingly complex ones, as Arsenicum, Hydrargyrum, etc. Many of the inorganic and chemical Adenagics depend upon a simple or elementary principle for their Adenagic power, as the Adenagic compounds of Chlorinum, Brominum, Iodinum, Sulphurum, etc. All these constitute cases, in which articles do not have all their properties changed by entering into strict chymical combination, since the Adenagic power of the compound is the identical power previously possessed by one of the elements. It is only external sensible properties that are changed by strict chymical combination. Occult properties, such as medicinal powers, are usually retained in such combination. So far as chemistry ascertains the presence of any one of either of these sets of elements in a given compound, it determines its medicinal powers; but it can not ascertain the powers of a new and untried element.

There are very many medicinally active compounds of inert elements, as Cyanogen and all the active Alcaloids; for the elements Hydrogen, Carbonum, Nitrogen and Oxygen, are neither medicinal per se, nor do they belong to that set of elements, which though inert per se, always impart medicinal powers. These latter active compounds of inert elements, retain their powers in most cases of more complex combination. At first view, some may consider Gaseous Oxygen as an exception to this statement; though for myself, I do not. Gaseous Oxygen when taken into the stomach produces no medicinal effects whatever, as I think has been pretty well ascertained by the taking of Water highly

charged with it. When inhaled, it does nothing but promote the decarbonization of the venous blood in the lungs. I consider it quite certain that it could produce no such effect when taken solid into the stomach. It is most probable that it would be absolutely inert when so taken, but this can not be determined with certainty, till it has been tried; and no such trial can be made till Oxygen has been reduced to a solid state without entering into combination. The effects which it produces by inhalation, are physiological rather than medicinal, and no other article operates at all in the same manner. It is true, we may avail ourselves of the effects of inhaled Oxygen for medicinal purposes, as for example, for the relief of Paresis of the pulmonary branch of the nerve of chemical action, nutrition and reproduction, which seems to constitute the essential pathological condition of Dyspnœa exacerbans, commonly but erroneously called Asthma; and in all probability also of Asthma verum, though this latter disease has very prominent peculiarities in comparison with the former; but the latter is of so rare occurrence that I never had opportunity to investigate as to what these peculiarities are due.

Electricitas Galvanica seems to be both Oresthetic and Adenagic.

From what I have thus far said of the power and operation of what I have chosen to denominate Adenagica or Adenagics, I trust we are prepared to understand the true import, and to judge of the propriety of a large number of terms, which have been in use almost time immemorial, among practitioners of medicine and authors on materia medica; terms, many of which were nearly unintelligible to me, till I had in a good degree matured my notions or ideas upon the Adenagics. Indeed almost all the singular and out-of-the-way terms in the whole materia medica—terms that are unintelligible from their etymology and without some explanation, to all the young members of the profession of the present period, will be found to have reference to the Adenagics. It would seem that this power in the materia medica is much like Syphilis in nosology. The latter was long considered by physicians as constituting at least five different specific diseases, so that no description as a whole, and by which it can be recognized, has come down to us from ancient times. Just so it is with this class, which has been considered as constituting about twenty

different specific classes, so that no definition of it as a whole, and by which it can be recognized as a unity, is any where to be found. All of the following terms undoubtedly had reference to some variety, grade or degree of what I call an Adenagic operation.

Deobstruentia.—I can not but believe that the term Deobstruentia, when first introduced into medicine, was intended to apply to the very power and operation, to which I apply the term Adenagic; and that still, with those who employ it at the present time, the same thing is intended, so far as those who employ the term have accurately made-up their minds as to its precise meaning. But it must be confessed that if we take definitions for a guide, it might never be suspected that any one can ever have intended the same thing by Deobstruent, which I intend by Adenagic. Hooper says that a Deobstruent is “a medicine that is exhibited with a view of removing any obstruction.” (*Hoop. Lex. Med. 4th Amer. Edit. N. Y. 1829, Sub voce.*) But what is an obstruction? This requires explanation even more than the term Deobstruent. Cullen says that Deobstruentia are “medicines suited to remove obstructions which have taken place in any of the vessels of the body.” He adds that “as a general term, it is improper; and as commonly employed for medicines, which are supposed to remove the obstructions depending upon a matter filling-up the vessels, it is commonly upon a false foundation, and therefore absolutely improper.” (*Bart. Cull. Mat. Med. Phila. 1812, Vol. I, Pg. 116.*) This definition of Cullen, if divested of its theoretical, or rather hypothetical language, and reduced to a mere statement of plain fact, would undoubtedly agree in general, if not in detail, with my definition of Adenagics. Swediaur says that “Deobstruentia denique appello remedia quæ præcipue Physconia abdominalis medentur.” (*F. Swed. Mat. Med. Paris. Pg. XI-XII.*) The definition of Swediaur is far from being strictly unequivocal, since the Salts of the Oxyd of Quininum are rapidly effectual for the cure of Physconia abdominalis v. Jecinatoris and v. Lienis (to use antiquated nomenclature) without being at all Adenagic, when such Physconia is produced by the essential and characterizing cause of Intermittent. But this Swediaur did not know; and his knowledge considered, his definition, though in reality not a true definition, is conclusive as to his intending by Deobstruents, what I intend by Adenagics.

The term Deobstruent is very often found in the writings of the older physicians ; and at no period since its first introduction into the science of medicine, has its use been intirely discontinued, either by authors or practitioners. This term appears to have derived its origin from the humoral pathology, in which mechanical obstructions of the vessels made a great figure as proximate causes. At all events, the term Deobstruent has long been applied not only to many true Adenagics, but also to a large number of articles not at all Adenagic. It is not at all uncommon to find many of our best known agents referred to classes in the materia medica, whose power they do not by any means possess. This is doubtless occasioned by a deficient knowledge of the nature and character of such power, in conjunction with imperfect or incorrect definitions, and also from a deficiency of an accurate and precise knowledge of the agent so referred. I have known physicians, who, from certain speculative notions, were in the habit of applying the term Deobstruent, or what they considered as perfectly equivalent, the term Alterative or Alterant, to all remedies whose operation is not supposed to be either exclusively invigorating, exclusively reducing, exclusively evacuant, or some combination of these. The perfectly hypothetical nature of almost all the received definitions, and indeed I may say their downright absurdity, together with the fact that most of the articles, which it was intended to comprehend, have other prominent properties beside their Adenagic power, doubtless caused the discontinuance of such a class of remedies in all modern systems of materia medica ; and the whole of these circumstances in conjunction, has thus served to divert the attention of physicians from one of the most useful and one of the most important powers of a very numerous class of agents.

Doubtless, from loose and indefinite notions of its true import, the term Deobstruent has long been applied much too vaguely to be worthy of retention in medicine. The intrinsic or etymological import of the term Deobstruent, viz. a remover of obstructions, is at once obvious to every one who has even a smattering of Latin, and constitutes a serious objection to it, since it conveys an incorrect notion, no such thing as a mechanical obstruction ever taking place in the vessels of a living animal body, except from a structural or organic disease, which is itself always and exclusively

re secondary affection. Lastly, this term is of pure Latin or instead of being derived from Greek, as the names of all the classes; and consequently its retention as the name of a would constitute an undesirable and disagreeable anomaly. I have been thus full in my remarks upon this denomination, because there would really seem to be no other name for this class of agents, sanctioned by authors, which is any more eligible, and I use at one time (in some discussion of this group of articles, introductory to an essay on Sanguinaria, published in the *American Medical Recorder*, Vol. XIII, No. 1, Jan. 1828.) I actually adopted it myself, bad as it is, for want of a better. However, I soon became satisfied that it is too highly objectionable to be retained, and I finally coined the term *Adenagica* as a substitute. Whether this is any better I leave my readers to judge.

Deöppilantia—Deöppilativa.—Hooper says that *Deöppilantia* and *Deöppalativa*, are "medicines which remove obstructions." (*Op. Lea. Med. 4th Amer. Edit. N. Y. 1829, Sub voce.*) Cullen says of the term *Deöppilantia*, that the articles to which it is applied are "supposed to act in the manner last mentioned" (i. e. *Deobstruents*) "and therefore upon a very doubtful foundation." (*Bart. Cull. Mat. Med. Phila. 1812, Vol. I, Pg. 116.*)

I take upon Cullen's authority, for I am not familiar with the term. If it is equivalent to *Deobstruentia*, it is certain that generally, if not invariably, denoted *Adenagica*. But these terms are not admissible as names of classes, because they are not Latin.

Secretiva.—Swediaur defines "*Secretiva*," as articles "*quæ actiones corporis secretorias augent.*" (*Swed. Mat. Med. Par. g. 500.*) If the *Adenagics* did nothing but increase secretions or excretions, a term some what like this might be appropriate, though not exactly this, since the termination *ivus* in English, has a simple active signification, so that *Secretiva* denotes, *that can secrete*. Besides the term under consideration is Latin. *Eccriseagoga* would be perfect for such a purpose.

But the *Adenagics* do not always increase the secretions, when they do, they produce other effects equally essential. Under certain circumstances, they restrain chronic profuse secretions or excretions, as *Blennorrhæa nasalis*, or in other words, *Adenagica chronica*.

Alterantia—Alterativa—Immutantia.—Swediaur defines *Alterantia* as being “*medicamenta statum corporis cacoehymicum aut cachecticum immutantia.*” (*Swed. Mat. Med. Paris. Pg. 457*) Hooper says that “*Alterative medicines are those remedies, which are given with a view to reëstablish the healthy functions of the animal economy, without producing any sensible evacuation.*” (*Hoop. Lex. Med. 4th Amer. Edit. N. Y. 1839, Sub voce.*) Cullen says that the term “*Alterantia* implies the same as *Alliötica.*” (*B. S. Bart. Cull. Mat. Med. Philad. 1812, Vol. I, Pg. 110.*) When the terms *Alterant* and *Alterative* have been employed in my hearing, I have been in the habit of inquiring for the sense attached to them by their employer. The reply has commonly indicated with more or less looseness, an *Adenagic*; though some times an operation materially and essentially different. I have often heard the terms *Alterant* and *Alterative* defined just as *Deobstruent* frequently is, viz. as including all articles, whose operation is not supposed to be either exclusively invigorating, exclusively exhausting, or exclusively evacuant. They are very commonly applied (as is likewise *Deobstruent*) to mere *Diaphoretics* and mere *Diuretics*. An American medical author says that *Alterant* and *Alterative* are “*common terms to designate remedies employed in small doses and for a*” (considerable) “*length of time, and by means of which we hope to produce a gradual change in the diseased economy, without their evincing sensible effects, such as by Purging, or Diuresis or Sweating.*” (*Bell on Baths, Philad. 1831, Pg. 395-6.*) Cullen says that the term “*Immutantia*” has the same meaning as *Alterantia* and *Alterativa*; and of course, it must be as applicable to my *Adenagics* as these latter terms are. (*Bart. Cull. Mat. Med. Philad. 1812, Vol. I, Pg. 111.*)

Alliötica—Alloëotica.—I suppose that instead of *Alliötica* (an orthography with which I never happened to meet) Cullen must undoubtedly intend *Alloëotica*, as found in Hooper's *Lexicon Medicum*, though, for aught I can perceive, *Allotica* would be better than either, since it would seem to be more simple and more legitimately formed, at least so far as I understand the etymology. I believe that this individual term is less employed than either *Alterant* or *Alterative*. Hooper defines *Alloëotica* as “*medicines which change the appearance of the disease.*” (*Hoop. Lex. Med.*

4th Amer. Edit. Philad. 1829, *Sub vocibus*.) This I take to be the real import—the true signification of Alterantia, Alterativa, Immutantia, Alliotica, Alloëotica, and probably several other of the terms that I shall hereafter mention, the vagueness and indefiniteness of the definition not withstanding. All the various attempts to limit and restrict the signification of the terms in question, because in their etymological sense they are really applicable to the whole materia medica, has always been a complete failure. They are still understood as being employed in the acceptance of this same definition. And yet, I can not doubt that the Adenagics have been almost invariably, if not always, had in view, when these terms have been used, and that all the attempts to give them greater definiteness and precision, have been unsuccessful attempts to distinguish the class of Adenagics from every other class in the materia medica. Cullen defines these three terms as “medicines suited to change the condition of the mass of the blood, particularly from a morbid to a sound state;” and he says they are frequently employed “for medicines suited not only to correct but to clear the blood from certain impurities supposed to remain in it.” Cullen adds, “with what propriety, and in what sense, these terms may be employed, we shall in the sequel have occasion fully to explain.” (*Bart. Cull. Mat. Med. Phil.* 1812, *Vol. I, Pg. 110*.) The terms Alliotica and Alterantia or Alterativa, are certainly very often indeed applied to this class of agents, as well as to classes and articles having essentially different powers. This term Alloëotica, is a very unusual one in comparison with its synonyms, at least as far as my reading in old books, and my acquaintance with those physicians who were old in the profession, when I was young in it, has extended. According to Cullen’s definition, it must certainly have implied Adenagics, though probably it was used with the same looseness and latitude as most of the terms that I give as synonyms of this class.

Depurantia. Cullen says that “Depurantia” are “medicines supposed to correct or evacuate the impurities which, upon any occasion, prevail in the body; but as no such specific power can be supposed in any particular medicine, the general term is groundless and extremely improper.” (*Bart. Cull. Mat. Med. Philad.* 1812, *Vol. I, Pg. 117*.) Hooper says that Depurantia,

Mundificantia and Anticachectica as synonyms of Alterantia. (*Swed. Mat. Med. Paris. Pg. 457.*) I believe that this is strictly correct, for I have no recollection of ever knowing them applied except to some unequivocal Adenagic.

Detergentia. Cullen says that "Detergentia" are "medicines supposed to promote the production of a proper, or as the language commonly is, a laudable pus in Wounds and Ulcers." Cullen adds "there are certainly various medicines which seem to answer this purpose; but whether they directly contribute to this, or only correct those circumstances which impede the operation of nature, is a little uncertain, and therefore it is doubtful whether the general term is proper or necessary." (*Bart. Cull. Mat. Med. Philad. 1812, Vol. I, Pg. 117.*) Does Cullen mean that the articles covered by this name are taken internally, or applied externally to produce a Detergent effect according to his definition? I have always heard this term applied to internal medicines, and they were almost always Adenagics; and I have always supposed that such were originally intended. But I have always known this term used in the sense of Depurantia, Mundificantia, Anticachectica, etc. instead of Cullen's sense. If the term were to be employed only in Cullen's limited and restricted sense, I should say that it could be much more applicable to Papaver, Wine (true and genuine), Alcohol and Cinchona, since these are far better than any other agents within my knowledge, "to promote the production of a proper or laudable pus in Wounds and Ulcers." If external remedies are intended, some of the Oræsthetica would best fall under Cullen's definition. "By Detergentia," says Hooper, "is intended, 1. a medicine which cleanses and removes such viscid humors as adhere to, and obstruct the vessels; and 2. an application that clears away foulness from Ulcers." (*Hoop. Lex. Med. N. Y. 1829, Sub voce.*)

The first of these two latter definitions, is much the most in conformity to my knowledge of the use of this term. It certainly refers to medicines taken internally; while the latter, as certainly refers to medicines externally and topically applied. I have repeatedly seen chronic Ulcers of more than a year's duration, that secreted no pus, but only a little ichor, that produced no granulations, and at any rate, had not been made to heal in the course of an intire year, under the charge of three or four physicians,

popularly reckoned the best in the place—a place containing about forty thousand inhabitants. The topical application of Oresthetics had been tried to a considerable extent, though without lasting benefit. The cases were then pronounced Cachectic, and what were called Detergents and Alteratives, were resorted to. These consisted of Decoctions of Smilax and Iodid of Potassium, with spare diet, which were used about three months, till there was great impairment of the tone of the system at large, and of the stomach in particular, with no disposition of the Ulcers to heal. Here the medicines employed, clearly indicated what these gentlemen understood by Detergents and Alteratives. The patients were able to call on the physicians at their offices till quite the latter part of the above course. If it were left to me, I would restrict the term Detergent to Soap and Water, externally applied with appropriate friction.

Digestiva. Cullen says that “Digestiva,” has exactly the same import as “Detergentia.” (*Bart. Cull. Mat. Med. Phila.* 1812, *Vol. I, Pg. 117.*) Hooper says of Digestiva, that it is a “term applied by surgeons to those substances, which, when applied to an Ulcer or Wound, promote supuration.” (*Hoop. Lex. Med. Amer. Edit. N. Y. 1829, Sub voce.*) I have never heard this term applied except to Oræsthetica, externally and topically used; and this term is still much employed among old surgeons, or was certainly, thirty or forty or perhaps fifty years ago, and for a long time previous. If it is even applied to medicines given internally, it is probably to Adenagics; though I think, as I have said of Detergents, that it would be much more applicable to Papaver, Wine, Alcohol and Cinchona. If Cullen had not connected the term Digestiva with Detergent, and if there were not reason to conclude that he some times comprehended internal remedies under the latter, I should not have mentioned Digestives in this place.

Incidentia. Cullen says that “Incidentia” are “medicines supposed to divide, or as it were, to cut-through the particles of our fluids, or to separate any number of these particles preternaturally cohering together.” Cullen says that this is “a power of medicine, which, as mechanical, I take to be quite imaginary, as we shall endeavor to prove hereafter, when we shall consider the power of medicines acting on the fluids.” (*Bart. Cull. Mat.*

Med. Philad. 1812, *Vol. I, Pg. 119.*) Hooper says that Incidentia are "medicines which consist of pointed and sharp particles, as Acids and most Salts, which are said to incide or cut the phlegm, when they break it so as to occasion its discharge." (*Hoop. Lex. Med. 4th Amer. Edit. N. Y. 1829, Sub voce.*) From the etymological signification of this term, I should never guess to what power in the materia medica it could possibly be applied, since I take it for granted that it is from incido, to chop; to cut; etc. and not from incido, to fall-upon or into; etc. What the power of a medicine to which the name Chopper is applied could possibly be, I never could have conjectured. But according to Cullen's definition, it must imply just about the same as Deobstruent, and consequently must have reference to the Adenagics. According to the essential part of Hooper's definition this term must have reference to one of the subordinate parts of an Adenagic operation, viz. to what I have called Blennagogue. Hooper's "pointed and sharp particles," are not to be found either in Acids or Salts; and Blennagogue effects are not produced in this manner; and Blennagogue effects appear to me to be very clearly intended by the essential part of this definition.

Attenuantia. The term Attenuantia, that is, *thinners*, would seem to imply etymologically, nothing more than Diluentia; but Cullen's definition clearly teaches us quite otherwise. Cullen says that "Attenuantia," are "medicines supposed to diminish the consistency of the animal fluid, either by dividing coherent masses or by diminishing the size of the larger particles." He adds, "with what propriety any medicines can be supposed to do this, will be considered hereafter, when I expect to show that the supposition is false, and the term therefore, inappropriate." (*Bart. Cull. Mat. Med. Philad. 1812, Vol. I, Pg. 114.*) From this definition it will appear at once that this class originated in the same pathological notions that gave rise to the class Deobstruentia; and that the operations of the two classes could not have been materially or essentially different; and consequently Attenuantia really has reference to the Adenagics. Hooper however, has very evidently been misled by the etymological signification of the term, as any man not a stated practitioner of medicine, which is said to have been Hooper's case) and consequently not a constant student of it, in connexion with practice might very

easily have been. Hooper says, that "an Attenuant or Diluent, is that which possesses the power of imparting to the blood a more thin and more fluid consistence than it had previous to the exhibition of the agent, such as Water, Whey, and all similar liquids." (*Hoop. Lex. Med. 4th Edit. N. Y. 1829, Sub voce.*) At that period of the humoral pathology, when so much was said of Attenuating or thinning, and of Incrassating or thickening the fluids, surely some thing more was meant by the former, than drinking a great deal of Water, and by the latter, some thing more than abstaining almost wholly from liquids. From Cullen's definition of Diluents, viz. "medicines which increase the fluidity of the blood, by increasing the proportion of fluid parts in it," it will be clear that he did not consider Attenuantia and Diluentia as the same. But to cut-off all opportunity of misapprehension in regard to this point, Cullen adds to the above—"this is the precise idea of Diluents; and if the term is applied to substances, which, by other means, increase the fluidity of the blood, it seems to be very improperly employed." (*Cull. Mat. Med. B. S. Bart. Edit. Philad. 1812, Vol. I. Pg. 117.*) As appears to me, Cullen is most decidedly correct in regard to Attenuants, while Hooper is as decidedly wrong.

Incrassantia. Cullen says that "Incrassantia," are "medicines supposed to have a power of thickening the consistence of our fluids." "How far there is a foundation for the use of such a term," (adds Cullen) "or in what sense" (it is) "to be understood, we shall consider hereafter." (*Ibidem Pg. 112.*) Hooper defines Incrassantia, as "medicines which thicken the blood." (*Hoop. Lex. Med. 4th Amer. Edit. N. Y. 1829, Sub voce.*) For myself, I can not well discover how the fluids of the body can be thickened, except by the excretion of their thinner parts in greater proportion than they are taken into the system. For example, by excretion of much watery or serous fluid into the upper and smaller intestines, and its subsequent discharge by the lower and larger intestines, in Epidemic Cholera, the contents of the blood-vessels are said to have been left of nearly the thickness and consistence of Tar. If this is the principle on which the Incrassantia operate, their relation to the Adenagics will be obvious. The act of Catharsis, when drastic, always affects the secernent and absorbent or glandular system, after the manner of the Adenagics,

so that I have always been in the habit of considering the process of drastic Catharsis as truly Adenagic while it lasts. Some times though rarely, the excretion from the renes is so active within a short time, as to leave the contents of the blood-vessels decidedly thicker. When this effect is factitious, I believe it is produced only by Adenagics. Those agents that merely increase the activity of a single excretory, in all probability, are never efficient enough to produce the effect under consideration. As appears to me, it can be accomplished only by agents that act upon the whole secernent and absorbent or glandular system, so that even this supposed class has reference to the Adenagics.

Inspissantia. Among those physicians who were old men when I began my professional career, I often heard the term *Inspissantia*. It was always employed in the same sense as *Incrassantia*. It is not found in Cullen or Swediaur, and a few other writers on the *materia medica* that I have just consulted. The term is not worth any further research, though it is doubtless as appropriate, and as good a term as that of which it is a synonym.

Aperientia. There is scarcely a term in the *materia medica* expressive of power and operation, which I have known so often used as *Aperient*; but it has been used very variously by different authors and practitioners of medicine. Cullen says, that *Aperientia* are "medicines suited to open obstructed passages, and particularly to open and restore suppressed excretions or evacuations, and most commonly applied to medicines suited to open the vessels of the uterus, and thereby to excite the retained, or to restore the suppressed menstrual flux." "The term therefore, as variously employed, both with respect to different cases and to different manners of operating, is, without specifying the particular case and operation, extremely improper." "It has farther been too often employed with respect to certain medicines whose power of answering the purpose proposed, is extremely doubtful." (*Bart. Cull. Mat. Med. Philad. 1812, Vol. I, Pg. 113.*) Hooper says, that an *Aperient* is an article "which gently opens the bowels." (*Hoop. Lex. Med. 4th Amer. Edit. N. Y. 1829, Sub. voce.*) The earliest authors and physicians of my acquaintance, very certainly employed this term exactly as *Deobstruent* has always been employed, i. e. in the general sense in which I employ

Adenagic, only with much greater looseness and want of precision. The writers and practitioners of a later period, but still considerably older men than myself, have employed this term in the sense of promoting the three so called fluid excretions, viz. that from the kidneys, that from the skin, and what is called the halitus from the lungs. That this latter was the sense intended, I took care to ascertain by actual inquiry of the employers of the term. For some years now just past, I have hardly known this term employed, except in the sense of Laxative, or some other grade or degree of Cathartic operation. This last appears to be the present received acceptation of Aperient, not only in our country, but also in Great Britain. When this term was in common use, it clearly referred to the operation which I now call Adenagic. Now I do not think that it is either expedient or judicious to revive an old and exploded term, founded on a false and long-departed speculation or hypothesis, giving it an intirely new sense, and one for which we already have much better terms, and which have been familiar to the profession time immemorial. I do not think that Eccoprotic or Laxative are to be considered as legitimate senses of this term.

Antisyphilitica, Antivenerea. According to Swediaur, "Antisyphilitica," are "medicamenta ad curandum Syphilitidem laudata; sed vix (Hydrargyro excepto, vel saltem sine ejus adminiculo) fidem merentia." (*Swed. Mat. Med. Paris. Pg. 467.*) I have long been perfectly satisfied that all true Antisyphilitica or Antivenerea, as they are some times called, are always Adenagics; and I can not doubt that there are several at least, which are capable of curing Syphilis perfectly. There is abundant testimony to this effect, and I think that I have had satisfactory experience. If there is no mistake about this, I can not but think that still other Adenagics will yet be found effectual for this purpose, when proper research has been made. The term Antivenerea is wholly inadmissible as the name of a class in the materia medica, because the term Venerea is applied to two at least, and perhaps more, essentially different diseases, requiring widely different remedies, which operate on intirely different principles. In addition to this, the term under consideration is pure Latin.

Incitantia, Incitativa, Excitantia, Excitativa, Stimulantia. This class has even been called Incitantia, Excitantia

and Stimulantia, as has every other class and operation in the whole materia medica. These terms I have already discussed sufficiently under the class Antisbestica, and elsewhere. I will only add here, that according to one definition that I have often heard given of them, viz. articles which make an impression and thereby produce a new action or condition, either upon the system at large or some of its parts, the Adenagics would admit the application of these three terms; but according to this definition, they would seem to be equally applicable to every other class in the materia medica. The answer to this has always been that all other classes in the materia medica imply some thing specific in addition to this, so as to be readily distinguishable by appropriate definitions.

All or nearly all the terms that I employ to denote the subordinate parts of an Adenagic operation, have been used in application to this class as a whole, though with very little accuracy or precision in reference to the true metes and bounds of their operation. It will be recollected that the terms which I employ to designate the subordinate parts of an Adenagic operation are the following, viz. Discutientia, Resolventia, Antipsorica, Sialagoga or Ptyalagoga, Blennagoga, Cholagoga, Emmenagoga, Diuretica or Uragoga, and Diaphoretica or Hidrotagoga. It may be proper to state here that Swediaur employs the term Resolventia in the sense in which I employ Discutientia, as will appear by the following definition. According to Swediaur, "Resolventia" are "medicamenta quæ externe applicata absorptionem humorum, in parte quacunque præternaturaliter congestorum, promovere videntur; hinc varia pro ratione morbi aut status ægroti." (*Swed. Mat. Med. Paris. Pg. 489.*) Where I have resided since I have been in the practice of medicine, my acceptance of this term has been the prevalent one.

The term *Apophlegmatizantia*, is of not infrequent occurrence among authors. Swediaur considers it as equivalent in signification to Sialagoga or Salivantia. Cullen says that Apophlegmatizantia are "medicines suited to excite the excretion of mucus from the Schneiderian membrane, and they are of two kinds, as the evacuation is made from the nose, when they are named Er-rhines; or as the same is made from the mouth, when they are named Masticatories." (*Cull. Mat. Med. B. S. Bart. Edit.*

Philad. 1812, *Vol. I, Pg.* 114.) As appears to me, the fact that the secretion from the mouth is materially different from the secretion from the nostrils, ought to cause a variation in the term employed to express such secretion or rather excretion. In the present state of our knowledge, I believe that there are no true and proper Sialagoga or Ptyalagoga, i. e. articles that operate directly and exclusively to increase the secretory activity of the salivary glands, without affecting any other part of the secernent and absorbent or glandular system; and the same is probably true of what I call Blennagoga. All the Apophlegmatizantia must therefore be Adenagics, and this specific operation, or these two specific operations, must be merely subordinate parts of an Adenagic operation. I have often heard the term Apophlegmatizantia employed by the physicians who were old men when I began the practice of medicine. These gentlemen always used it in the sense of a remedy for the Chronic Blennorrhœa, more particularly Blennorrhœa nasalis, commonly known by the name of Coryza chronica. In all the Blennorrhœa, the patient is harrassed with an excessive and inordinate secretion of mucus from the mucous membranes, and suspending this secretion is considered as Apophlegmatization. In this last acceptation, all the agents to which this term can be applied with any shadow of propriety, must be Adenagics.

According to Swediaur, "*Galactophora*" are "*medicamenta secretionem lactis augmentia.*" Swediaur says, that "*Lactifera*" is a synonym. (*Swed. Mat. Med. Paris. Pg.* 482.) If there are any such agents as Galactagoga, I can not doubt that they are true Adenagics. Those articles that operate immediately, directly and exclusively upon a single excretory, so far as is known at present, are never very active; and as appears, very great activity would be required for the production of any material increase of the secretion from the mammary gland, its character being considered. There might be Galactagoga (rather than Galactophora) that are not Adenagics, but articles acting immediately, directly and exclusively to increase mammary secretion, without affecting any other part of the secernent or glandular system. I have no knowledge however, of any such articles. It is possible that some of the Adenagics may be capable of increasing the secretory activity of the mammary gland, as a part of a

general operation upon the glandular system. If this is the fact, a Galactagogue operation must be reckoned as a subordinate part of an Adenagic operation.

NEXUS SECUNDUS.

The second Nexus, Alliance or group of classes, may be considered as characterized by the circumstances that their essential operation is a supposed remedial evacuation from excretories remote from the parts on which the agents producing them make their primary and principal, if not their sole impression, as I think, never coming into contact, at all events, not immediately, with the excretories more especially affected. It is however, to be particularly remarked, that a distinction between this group and the next, does not depend merely upon the establishment of the doctrine of the production of the remedial effects of medicines previous to, or without their reception into the mass of the circulating fluids. The distinction remains equally obvious, in which ever way any individual may choose to consider this point as decided.

13. DIURETICA vel URAGOGA, 14. DIAPHORETICA vel HIROTAGOGA,
15. ?BLENNAGOGA, 16. ?EMMENAGOGA,
17. ?ECBOLICA.

PROËM TO THE CLASS DIURETICA.

The term Diuretica is derived from an ancient Greek verb, signifying "*to discharge by urine;*" and this verb is compounded of a Greek proposition signifying "*through*" or "*by;*" and a Greek noun-substantive signifying "*urine.*" The term Diuretica is strictly and properly an attribute used as a noun-substantive in application to this class of agents. The term Diuresis is a regularly formed noun-substantive, from the Greek verb denoting "*to*

discharge by urine," and of course it signifies "*a discharge of urine,*" and consequently the effect of a Diuretic. The term Uragoga (really much to be preferred to Diuretica) is derived from a Greek noun-substantive, signifying "*urine,*" and a Greek attribute signifying "*alluring; leading; guiding;*" etc. The term Uragogia or Uragogy is also a regular noun-substantive, derived from Uragoga, and having the signification of "*a discharge by urine,*" or the effect of a Uragogue.

Definition.—Diuretics or Uragogues, are articles which by direct, immediate and exclusive operation upon the renal glands or kidneys, restore the excretion of all those effete elements of the system, which pass-off as Salts held in solution by water, when such excretion is suspended; augment it when such excretion is diminished; and increase preternaturally the proportion of Water in this excretion, when it was previously in the natural quantity; and all this, without any influence upon any other part or parts of the secernent and absorbent or glandular system, and without either increase or diminution of vital energy and strength of action, but merely by an increase of excretory activity.

Diuretics or Uragogues do not appear to change the quality of the urine in any way, except to augment the proportion of Water which it contains, when this excretion is increased preternaturally by them. That an article may properly belong to the medicinal class of Diuretics or Uragogues, the renes should be the only part of the secernents and absorbents, or in other words, the glandular system, on which it acts. If it operates upon the whole of the glandular system, affecting the kidneys only as a part of the secernents and absorbents, it is an Adenagic, and should properly take rank in that class, and not among the Diuretics. Such an article might just as well be called a Diaphoretic, a Blennagogue, or an Emmenagogue, as a Diuretic. There is unquestionably a very material difference between articles that operate upon the whole glandular system, and articles that operate only upon a single excretory; and to associate such diverse articles into one class, without distinction, must certainly be subversive of useful discrimination. The Diuretic part of an Adenagic operation should never be overlooked; but it is by no means expedient to mingle Adenagics with mere and pure Diuretics into one promiscuous class, any more than it is to confound the two in practice; nor is it

ever expedient to employ a given article for one power alone, without carefully considering what other power or powers it may exert. I would therefore exclude all Adenagics from the class Diuretics, though I would not exclude them from employment for the production of Diuresis, provided their general operation upon the whole secernent and absorbent or glandular system, is not contraindicated in the case. It may be proper therefore, to have at the heel of the catalogue of Diuretics, properly grouped, a list of the Adenagica propria ad diuresin producendum communiter adhibita.

I consider it important for judicious prescription, that the Adenagics should be distinguished from the mere Diuretics, Diaphoretics, etc. since in a given case, a mere Diuretic may not be capable of at all answering the indications, an Adenagic being necessary; and again, there are cases in which a mere Diuretic is indicated, and an Adenagic might be more or less injurious if nothing more. If this distinction is not pointed-out by instructors and authors, it will be wholly overlooked by many young practitioners, and doubtless by some elderly ones. In Hydrops for example, mere Diuretics are of very little value, since the effusion of fluid into the cavities or the cells of the cellular substance, is not the essential part of the disease, but merely one of the effects of the essential part. The truly essential part seems to be benefited by Adenagics, but not at all by mere Diuretics. In Hydrops then, a mere Diuretic is calculated to obviate a single symptom only, and one which is secondary and subordinate in the pathology of the disease, and therefore it may easily be seen that mere Diuretics have no sort of claim to be considered as radical remedies in this malady. On the contrary, Adenagics, by virtue of their operation upon the whole secernent and absorbent or glandular system, are frequently (though not always) capable of counteracting and overcoming the morbid condition and action of the whole of this subordinate part of the animal economy, which precedes and accompanies the effusion of fluids, and thereby they seem some times to be capable of proving radical remedies in this disease. Adenagics however, are not all that is necessary for the unessential accompaniments of protracted and obstinate cases. If these views are correct, they will in some measure illustrate the utility of distinguishing mere Diuretics from Adenagics.

neys, which is a mechanical use; and in both it performs a function strictly analogous to its holding Salts in solution in the urine, which may perhaps be called a chymical office. The excretion of Water from the skin is probably always normal, except in *Epidrosis profusa*, in which it is doubtless pathological.

Again, a large amount of Water some times passes-off by the lower and larger intestines, as in some sudden, intense and very rapid cases of Cholera, and some equally sudden, intense and rapid cases of *Diarrhœa*. Even in many cases of unrestrained and protracted *Diarrhœa chronica*. I have often known so much Water to pass-off steadily by the intestines, that very little was left to be excreted by the renes, and still less by the skin, so that the lungs seemed to be the only excretory for the heat, the only cooler of the system; and even at this, they were not very severely taxed, since there was not much heat set free, under such circumstances. Even in the case of morbid effusions into the great cavities of the body and more especially into the cells of the cellular substance, the Water is oftener carried-off by the lower and larger intestines, than by the renes. The discharge of Water by the alimentary canal is never normal, but always pathological. I do not however, consider the kidneys as the especial emunctory of the effete Water of the system, any more than the lungs or the skin, and it can not therefore be said that there is any peculiar excretory for the effete Water of the system, the renes not excreting more of it in general, than the skin, or the lungs, or the intestines, under certain circumstances.

Thus far the uses of Water in the animal economy may be said to be merely mechanical; unless we consider the holding of Salts in solution as chymical in contradistinction from mechanical.*

But the especial use of Water in the renal excretion is to hold in solution all the effete matters of the system, which must pass-off by this emunctory, mostly in a Saline form. Its power of

* The equable diffusion and retention of the solid particles of a heavier Salt throughout Water a lighter liquid, must, as appears to me, be due to a sort of attraction; and as it is an attraction between heterogeneous particles, it may possibly be ranked with propriety as a variety of affinity. But there is a very essential difference between that sort of attraction, which unites Sodium a solid and a metal with Chlorine a gas, and that which constitutes a solution of Chlorid of Sodium in Water; so that if any body chooses to consider them as distinct species (instead of mere varieties) of attraction, I shall not differ materially with them.

keeping the soft parts of this apparatus pliable or flexible, however necessary this may be, is only a secondary office of Water. If it were not for the mechanical and chymical offices of it, which I have just mentioned in connexion with the renes; and both similar and analogous ones which I shall hereafter mention in connexion with two other emunctories, viz. the skin and the bronchial membrane, Water might be wholly dispensed with in the whole system, except in the alimentary canal, and the sanguiferous system. Assuredly neither of these emunctories is any more the proper one for effete Water than the kidneys.

It would probably have been considered an important omission if I had not mentioned Water as a substance excreted freely by the renes or kidneys. From the amount some times discharged by this emunctory, in some of the species of Paruria, it would seem that occasionally much of the effete Hydrogen and Oxygen of the system must go off temporarily in the form of Water by the renes. But I doubt whether this is generally the fact, some times it seems as if no more Water is excreted by all the emunctories in conjunction, than is swallowed, but I am unable to say with certainty, what may be the fact generally. The excretion of Water as described in connexion with the kidneys is normal then, except in some cases of Paruria, in which it appears to be generated within the system, when it is pathological. I repeat that Water is not nutriment; and in health, does not strictly constitute effete matter.

The essential seat of the operation of all the true and proper Diuretics, is undoubtedly in that part of the involuntary motor nerve of chymical action, nutrition and reproduction, which is sent to the renes. The essence of the operation of a Diuretic, as appears to me, is always an increase of excretory activity in the renes; without any increase or diminution of power or energy, or in other words, strength of action.

The Diuretics or Uragogues might be divided into groups founded upon the peculiar quality of their operations; and this has been often attempted; but according to my judgment, never with much success, at least so far as I have information. A principal defect in every such grouping that I have ever met with, has consisted in the hypothesis, that many of such groups do not operate primarily and directly upon the renal glands, but often

upon parts quite remote from them. Besides, every one of such groupings that I have ever seen, has always comprised the Adenagics, i. e. articles that operate in a peculiar manner upon the whole secernent and absorbent or glandular system, and upon the renes only as a part of this more general operation. Now as I have said else where, such articles can no more be ranked with the Diuretics, than with the Diaphoretics, and cannot be merged in either of these classes, nor any other, which is founded upon an operation on one single excretory.

Dr. Paris supposes that mere Diuresis "is produced by very different modes of operation"—and he says that—"some of the Diuretics are mutually incompatible with each other"—and therefore he infers that—"it is essential that we should understand the *modus operandi* of each individual, of which the class consists, in order that we may direct its application with precision." Now, as appears to me, all Diuretics merely increase the secretory activity of the renes directly and immediately, and this is all. But Hydrops occurs under a considerable variety of conditions, requiring various other powers beside that of a Diuretic for their relief. In conformity with this, we find various other powers associated with that of a Diuretic; and as the operation and effects of such agents, is the joint result of all the powers exerted, all Diuretics, which are not simple and pure, may be truly said to vary in their operation according as there is a variation of the power or powers associated.

For example, an Antiphlogistic Diuretic may be said to differ in its operation from an Antisbestic-Diuretic, and such articles may in fact be incompatible with each other, though the Diuretic part of the effects so far as we can perceive, may be perfectly identical, i. e. merely a direct and immediate increase of the secretory activity of the kidneys. This seems to me to constitute all the practical difference that exists between the different Diuretics. For example again, the Bitartrate of Potassa is decidedly Diuretic; but in addition, it is directly and efficiently Antiphlogistic or exhausting, Neuragic and Cathartic. On the other hand, Alcohol, though decidedly Diuretic, is also Antisbestic, Euphrenic and Oresthetic, and under Diaphoretic regimen, and in appropriate cases, Diaphoretic also. As mere Diuretics, I consider the operation of these two agents (so far as can be perceived) as per-

fectly identical, though their accompanying powers render them incompatible with each other, and adapted only to widely different cases.

Should a case of Hydrops occur, intirely destitute of any atony, or exhaustion of any of the parts dependent upon the nerve of chimal action, nutrition, etc. but on the contrary, attended with entony or an increase of vital energy and strength of action in these same parts (I shall not pause here to ascertain whether such a case ever existed) the Bitartrate of Potassa would be an appropriate Diuretic, while Alcohol would be a very inappropriate one; and if employed would doubtless do injury. Should a case of Hydrops occur, attended with great atony, or exhaustion of all the parts dependent upon the nerve of chimal action, nutrition, etc. Alcohol would be one among a considerable number of Diuretics appropriate to such a case; and Bitartrate of Potassa would be eminently inappropriate, and if administered, would doubtless do injury, as I have repeatedly had opportunity to witness. I might give many more equally good illustrations, though perhaps not as prominent ones, of such diversities in the additional operations and effects of the Diuretic agents in the most common use.

There is a considerable number of the Diuretics, or the articles used for this purpose, that are neither exhausting nor invigorating, and that possess no other powers, which are contraindicated in either of these sets of cases, and of course, are admissible in both, though the simple and pure Diuretics are seldom very effectual, unaccompanied with such other remedies as the general condition of the system, and the circumstances of the case may happen to require in addition to the Diuretic.

Dr. Paris supposes that there is one group of Diuretics which "act primarily on the urinary organs"—"stimulating the secreting vessels of the kidneys, by contact"—"the medicines not undergoing any decomposition in transitu." (*Paris's Pharmacol. 2d Amer. fr. 5th Lond. Edit. N. Y. 1824, Vol. I, Operat. Med. Pg. 123.*) The articles belonging to this first group, are "Potassa, Potassæ Nitras, Oleum Terebinthinæ, Juniperus communis, Cantharides." (*Ibidem.*)

2. A group which "act primarily on the urinary organs"—"stimulating the secreting vessels of the kidneys, by contact." "The

medicines undergoing decomposition in transitu." (*Ibidem.*) The articles belonging to the second group, are "Potassæ Acetas, Potassæ Supertartaras, Scilla maritima, Colchicum autumnale, Copaiïfera officinalis, Spartii Cacumina."

3. A group which "act primarily on the absorbents, and secondarily on the kidneys." As belonging to this third group, Paris mentions only "Mercury."

4. A group which "act primarily on the stomach and primæ viæ; and secondarily on the absorbents," "by diminishing arterial action, and increasing that of absorption." (*Ibidem.*) The articles belonging to this fourth group, are "Digitalis, Nicotiana."

5. A group which "act primarily on the stomach and primæ viæ, and secondarily on the absorbents," "by increasing the tone of the body in general, and that of the absorbent system in particular." The articles belonging to this fifth group, are "Bitter Tonics."

6. A group which "acts primarily on the stomach and primæ viæ, and secondarily on the absorbents"—"by producing Catharsis, and thereby increasing the action of the exhalents directly, and that of the absorbents indirectly." The articles belonging to this sixth group, are "Elaterium, Jalap."

The preceding is copied verbatim from Dr. Paris, with the preservation of his order exactly, only it has suited our convenience to vary the numbering, which does not vary the import in the most trifling respect. Some of Dr. Paris's Diuretics operate exclusively upon the kidneys only as a part of a general operation upon the secernents and absorbents or glandular system. In other words, some of them are true and proper Diuretics, while others are in fact Adenagics. Surely this is a fact worthy of cognizance in this connexion—a fact which must often affect the selection of a remedy for a given case.

But every one of the articles specified by Dr. Paris as belonging to the class of Diuretics, possess other different and distinct powers. Are there no mere and pure Diuretics in the materia medica? If there are not, it is well to know it. Is a knowledge of the different and distinct operations that are exerted by the articles, which we employ for the production of Diuresis, of no importance? Is not such knowledge essential to the best regulation

of their application, and for the most judicious determination of the particular cases to which they are adapted, and in which they are indicated? And yet in his classification at least, Dr. Paris does not give us even a hint of the existence of any such different and distinct powers; and his grouping seems to be in utter defiance of such a fact.

But further, Dr. Paris supposes that his first two groups stimulate the kidneys by actual contact. This operation, Dr. Paris calls "stimulating." But how can an Antiphlogistic or exhausting agent (as a number of Dr. Paris's articles are most decidedly) stimulate in any legitimate acceptance of the term? I answer that it does not, and that the only sense, in which this term can be taken here, is that of making such an impression, either mediately or immediately, upon a part or organ, as is necessary for the production of its medicinal effects, this is all which this term means here, and I will only add that it is by such misapplications and perversions, that this word has been rendered incapable of conveying any specific notion in the *materia medica*, Diuretics, as such, and independent of any additional power or powers, are certainly not stimulants in the sense of producing a quickly diffused and transient increase of vital energy and strength of action in any part or parts dependent for their motive power upon the involuntary nerve of chymical action, nutrition and reproduction. This is the only acceptance in which this term is worthy of being retained in the *materia medica*. But from such observations as I have been able to make, I believe that every one of the really Diuretic articles enumerated by Dr. Paris, produces its effect by its impression upon the organs of primary digestion, viz. the stomach, and upper and smaller intestines; and to all appearances they cease to produce any such effect, when they have passed out of these organs. Some of them are doubtless digested, (i. e. decomposed and recomposed into a new form under the influence of vitality) and some of them are not. Of course, when digested, they must necessarily cease to produce any further Diuretic effect. When an article taken into the stomach is decomposed instead of being eliminated entire, how is it possible to ascertain that its decomposition does not take place in the organs of primary digestion, and that it does positively take place in a given excretory or emunctory, as the kidneys for example. If

any individual agent can actually be found in the mass of the circulating fluid after being taken into the stomach, the question immediately arises, does the whole so taken pass into the blood? This can be tolerably well judged of, by ascertaining the quantity contained in a given portion of blood, calculating the quantity that must be contained in the whole mass, and comparing this with the quantity swallowed. But should the whole quantity taken pass the organs of primary digestion, the mesenteric glands, etc. and get into the blood, we should still need proof of its decomposition in any particular emunctory. The fact that the primary manifestations of its medicinal operation happen to be in such emunctory, would not prove it, unless we assume that every article of the *materia medica* must be brought into contact in its intire state with the part or organ upon which it especially operates, and (if decomposable within the system) be decomposed by it. It seems to me that it would be preposterous as well as destitute of all proof, to suppose that *Claviceps* (or *Spermœdia*) when it operates as an Ecboic, is actually brought in its entire state, into contact with all the muscular fibres of the uterus; or the *Erethistic Strychni*, when they produce Tetanic Spasms in the whole voluntary muscular system, are actually brought, in their intire state, into contact with all the fibres of the whole voluntary muscular system—to say nothing about decomposition by the organs or parts on which these several articles act more especially.

But the Sulphate of Oxyd of Morphinum, when injected in aqueous solution into the blood-vessels, undergoes decomposition in the blood, and that very speedily. Now why may not some of the easily decomposable Diuretics, when they pass intire through the organs of primary digestion, (which I can not believe often happens) undergo decomposition in the blood? If a given agent that has been taken into the stomach is actually found intire in the blood, this only shows its capability of passing through the organs of primary digestion into the blood-vessels; it does not prove that it did not produce all its medicinal effects while in the stomach and upper and smaller intestines, nor that it may not undergo decomposition while in the blood. I know of no evidence (Dr. Paris may know of much) that the several emunctories ever decompose medicinal substances indecomposable in the organs of primary digestion, and in the blood. In short, there are several

preliminary things that require proof, before I can admit Dr. Paris's views, even as plausible imaginings, to adhere to Paris's language.

Of those which are not digested, very greatly the largest portion passes off by the alvine canal along with the fæces. Of some of them, small quantities appear in the excretions; but the amount of Diuretic effect (when this takes place at all) is always proportioned to the quantity taken and retained for a sufficient length of time in the organs of primary digestion, and never to the quantity that appears in the excretions. Even of those articles that are digested, some of the new products of such digestion often appear in minute quantity in the excretions, such (for example) as the substance which gives the Violet odor to the urine after the Oleiresin of *Copaïfera* has been taken. Some physicians suppose this to be a portion of the Oleiresin itself; but such, (as appears to me) can not be the fact, no such substance has ever been detected (so far as I know) in the article previous to digestion. It is perhaps hardly necessary to say that these new products, in their minute quantity, do not appear to enhance the medicinal effects of the substances out of which they are formed.

It is always of more or less importance to take cognizance of any other power that may chance to accompany the power of producing Diuresis, the fact that an article possesses Antiphlogistic or Antisbestic powers in addition to Diuretic powers, should never be forgotten. It is not infrequently the fact that a conjunction of a Narcotic with a Diuretic power is better adapted to the exigencies of a given case, and will produce better effects, than any thing else.

Where Diuretics alone have intirely failed of producing their legitimate effects, I have repeatedly known susceptibility to their due influence restored by the conjunction of Oresthetics. The Antisbestic and Oresthetic powers of the *Cantharis* are often of as much importance in the treatment of *Hydrops*, as its Diuretic power. The same may be said of *Alcohol*, which benefits *Hydrops*, not only by its Antisbestic and Oresthetic powers, if it is not too much diluted, as well as by its Diuretic power, while its Euphrenic power is of no disservice.

A Tonic power is frequently indicated in conjunction with a

Diuretic power, which may be supposed to render proper the several medicinal species of *Cissampelos*, as *C. Pareira*, *C. microcarpa*, *C. glaberrima*, etc. and also *Abuta rufescens*, etc.

Some times a Styptic Diuretic will operate far better in a given case, than any other. Under an appropriate adaptation of medicines, such as I am commending, one physician obtains effects from a given article, which another, who does not regard such adaptation, intirely fails of producing. I doubt not that much of the discrepant testimony in regard to the powers and operations of medicines, may be traced to this cause.

A statement of what I conceive to be the true operative analogies and affinities of the articles mentioned by Dr. Paris, might be a sufficient comment upon his notions and views. Potassa, Acetate of Potassa, Nitrate of Potassa, Bitartrate of Potassa, etc. constitute a perfectly natural group, since they all possess the same additional powers, viz. they are all Antiphlogistic or Exhausting and Neuragic. We may perhaps say that Bitartrate of Potassa possesses a single additional power, viz. a Cathartic one, but Acetate of Potassa is also Cathartic if taken in a full dose, and I have seen one or two free alvine discharges from a very large dose of Nitrate of Potassa, considerably larger than it is ever expedient to take for medicinal purposes. I do not know whether Potassa ever operates in this manner or not.

It is my opinion that none of the four articles just mentioned are thus decomposed, although Dr. Paris thinks the Acetate and Bitartrate of Potassa are so. Potassium, I believe, is an ingredient of the human body, as it is of plants, in both of which it exists in some other state of combination beside that of Oxyd or Salts of the Oxyd. Where this is the fact, the living animal economy will obtain it by decompositions which we should not expect a priori. For such a purpose, the articles under consideration may perhaps be decomposed. As, at all events, the Oxyd must be decomposed to furnish Potassium for a different compound of it, I should think that this substance taken as a medicine would be as likely to furnish the required Potassium as any Saline compound of it. But if the Salts are ever decomposed in the organs of primary digestion, I should think that the Acetate and Bitartrate would be more likely to suffer such decomposition, than the Nitrate, because the Acetic and Tartaric Acids have

weaker energies of attraction than the Nitric, and their elements are held together by feebler affinities.

Now I do not consider it of a farthing's consequence to a Diuretic, whether it is decomposed in transitu or not. It is proper to state here that though all these articles have a certain degree of Diuretic power, yet that is so small as to render them of little or no consequence as Diuretics. If we had none more effectual, in my opinion it would not be worth while to recognize such a class in the materia medica, since it would be of no remedial value. Did any physician ever succeed in removing the effused fluid of a serious case of Dropsy, either by one, or the whole of these articles as Diuretics merely? I never heard of such a case, and I have no expectation of ever hearing of one.

Cytisus scoparius (or *Spartium*, as Paris calls it) *Urginea maritima*, *Colchicum autumnale*, etc. constitute a sufficiently natural group. All of them are Adenagics, and all prove Diuretic merely as a part of their Adenagic operation. All of them possess the additional power of Cathartics, and all of them are also exhausting, the last very eminently so, even in a degree to constitute a serious objection to its use for its Diuretic effects merely. *Colchicum* is reputed to possess still another power which does not belong either to *Cytisus* or *Urginea*, and this power is commonly called Narcotic, but I strongly suspect that it is what I call Erethistic. I never studied it sufficiently however, to be able to pronounce upon it. These articles, if taken in proper quantity, are probably decomposed in transitu; but in what possible way can this affect their Diuretic operation? It would doubtless be just as well in relation to this operation, if they passed-off undecomposed by the alvine canal; they might in such a way not operate quite as pleasantly, since digestible medicines are in general more kind in their effects than indigestible ones.

Oleum Terebinthinæ, *Juniperus communis*, *Copaïfera officinalis*, (if there is any such species) etc. make another natural group. The Terebinthinate Essential Oil (the active principle of these three articles) has the same identical composition as contained in the whole of these agents. In the Oleoresin of *Copaïfera*, a small portion only of it is resinified, which does not materially affect the quality of its operation or the amount of its effects. The whole of these articles are Adenagics, and as Diuretics

only as a part of their Adenagic operation. In addition to this, they are all Euphrenic and Cathartic in a sufficient quantity. They have the reputation of being Antisbestic also, and probably may really be so, though I have never happened to witness this effect from them. Externally applied they often prove Oresthetic, and therefore they must be more or less so, when taken internally. In a moderate or rather small quantity, Oil of Turpentine is digested, and of course decomposed in transitu. In a large quantity, it passes-off by the alvine canal unchanged, so that Dr. Paris is correct in part in ranking it as not decomposed in transitu; and yet, when managed so as to be the most effectual as a Diuretic, I believe it is commonly decomposed.

But I repeat my inquiry, of what importance is it to their Diuretic operation, whether they are decomposed in transitu or not. These are Diuretics of some, though not of first rate importance. In Dr. Paris's catalogue, Cantharis is an insulated article, nothing else like it being mentioned. Beside its Diuretic power, it is efficiently Oresthetic, and more moderately Antisbestic. Its active principle in moderate quantity is probably digested, and if so, it is of course decomposed in transitu, contrary to Dr. Paris's opinion; but as will be inferred, I deem this of no importance in relation to its Diuretic operation. In conjunction with some other articles, and particularly Digitalis, Cantharis is a most important Diuretic.

By Mercury, Dr. Paris undoubtedly intends the Mercurials generally, or at least, a greater or less number of them. The Mercurials are all Adenagics, and are Diuretic only as a part of their Adenagic operation. The different compounds of Hydrargyrum have different additional powers. The Dichlorid, and the Disoxyd (the preparations most commonly used) are Cathartic, Subemetic and Neuragic, in addition. Their action is as much primary upon the kidneys as upon any other part of the secretant and absorbent or glandular system, contrary to Dr. Paris's opinions. These two articles by themselves, seem to me to be worthless as Diuretics, though they often greatly assist other Diuretics, provided the general condition of the system is appropriate for the operation of the Mercurials. Upon the whole, these two articles do not deserve the rank even of Adenagic-Diuretics. They are only auxiliary to Diuretics under certain circumstances.

If used with any efficiency, or for any length of time, I believe that the Mercurials always produce more or less exhaustion, though they are by no means Antiphlogistic, as some suppose them to be; nor Tonics as John Murray makes them. As a degree of exhausting power that falls short of the production of any degree of Antiphlogistication, is not a medicinal power, of course I have no class founded on such a power.

Dr. Paris does not tell us whether the Mercurials are decomposed in transitu or not, I can not discover why this point is not of as much importance in relation to them, as in relation to any other group of real or supposed Diuretics. A priori, I should not suppose that they would be decomposed; but I have considerable reason to believe that some of them some times are. I think that such is some times, if not always, the fact with the Dichlorid of Mercury. In some cases of disease, where a large quantity of this particular compound has been administered after the whole alimentary canal had been very thoroughly cleared, it has passed-off in the form of a black powder, which I have always supposed to be the Disoxyd. How it should have been so changed, perhaps I may not be able to say. I have however, always supposed that it must be through the instrumentality of the Soda contained in the gastric and pancreatic liquors; and yet, I have always supposed also, that the sum of the affinities of Sodium and Oxygen must be greater than the sum of the affinities of Sodium, and Chlorine, and Mercury, and Oxygen. But, as is so often quoted, there is no argument like matter of fact. The neutral Carbonate of Potassa converts the Dichlorid of Mercury into the Disoxyd; and so doubtless would Oxyd of Potassium, and if this will do it, so in all probability will the Oxyd of Sodium. The experiment may be very easily made, and probably has been made; but I have never taken the trouble to make it, nor to obtain definite testimony in relation to it. At all events, I have witnessed facts, which have led me to the conclusion that the Dichlorid of Mercury is always (normally at least) reduced to the Disoxyd in the alimentary canal. I once had knowledge of a case of Colica Ileus, in which a large amount of the Dichlorid was taken within a very short time, which finally passed-off by the lower and larger intestines, pretty much together, but still as Dichlorid, and not as Disoxyd. In this case, there might have been a morbid defi-

not Dr. Paris here specify whether these articles are decomposed in transitu or not? Surely it is of as much consequence (if one at all) in relation to *Digitalis* and *Nicotiana*, as in relation to Dr. Paris's first two groups.

Digitalis and *Nicotiana* agree only in two respects. Both are narcotics, and Diuretic only as a part of their Adenagic operation; and both are Narcotic. The primary action of both these articles (as primary action is commonly understood) is certainly not upon the secernent and absorbent or glandular system, and not upon the stomach and *primæ viæ* (to use Dr. Paris's very language) than all medicines that are taken into the stomach. The primary impression of all medicines so taken, is always upon the organs of primary digestion; but we commonly say that they act primarily upon those subordinate parts of the system, in which we perceive the first manifestations of their medicinal effects. The first remedial effects from these articles, of which I have been able to take cognizance, is greater or less absorption of effused fluid, which is assuredly an action upon the absorbent system.

Under any other method of estimating the seat of primary action, we should be obliged to say that the primary action of all medicines is always upon one and the same part. *Digitalis* respects additional different and distinct powers, *Digitalis* is narcotic only, so that it possesses only two powers, while *Nicotiana* possesses at least five, it being Euphrenic, Narcotic, Cathartic and Emetic, beside being Adenagic. *Digitalis* is far more valuable as a Diuretic than *Nicotiana*. In fact, *Digitalis* is one of the most valuable Diuretics in the whole *materia medica*. I have no reason whatever to conclude that the actual contact of the medicine (and certainly not of a pure Diuretic) is ever necessary in any case, to the production of its regular effects in any organ or organ. The only evidence which we have of the actual contact of a Diuretic with the kidneys is the excretion of such agent in the urine. Now I have never witnessed such excretion; except in a very few instances and this has always been some time after the production of the Diuresis, and only a small quantity of the Diuretic has been thus excreted. But as I have said elsewhere, the effect of the Diuretic (when there has been any) has always been proportioned to the amount of the agent taken, and is proportional to the amount thus excreted. Besides, it is my belief that

there is not a single article belonging to this class, which may not by peculiar management, be made to produce its fullest Diuretic effects without even a trace of it in the urine. As appears to me, these facts (if there were no other objections) are conclusive against the necessity of actual contact of the Diuretic with the renes, for the production of Diuresis.

The Saline Diuretics (commonly so reckoned) such as Nitrate of Potassa, Chlorite of Potassa, Bitartrate of Potassa, Acetate of Potassa, Bicarbonate of Potassa, Sesquicarbonate of Potassa, Carbonate of Potassa, and probably all the analogous Salts of Soda, may readily be made to prove Diuretic without any manifestations in the urine, while some of them may be made to prove Diuretic, and afterward to appear in small quantity in the urine. It is here worthy of particular remark, that (as I have said elsewhere) none of these articles possess a sufficient amount of Diuretic power to be of any material value, or indeed of any value at all, in medicine, for this effect. Dr. Paris himself expressly says of Nitrate of Potassa, that "as a Diuretic, its powers are too inconsiderable" (to render it worthy) "to be employed" (for this purpose.) I confidently believe (as the result of my own researches) that these articles produce all their effects as medicines while they are in the organs of primary digestion, and before they get into the blood-vessels, unless perhaps, it may be a slight irritation of the emunctory organ whose function is to eliminate a part of them, when superabundant, and when this organ is not the alvine canal. As it is the province of the renes to carry-off all those effete elements which are capable of taking the form of Salts soluble in Water, we should expect to find in the urine a greater or less amount of the Salts employed as medicines, though we should not expect to find the whole, since the quantity of them necessary for medicinal purposes is in general much too large to be capable of passing into the mass of the circulating fluids, and of being eliminated in the urine. I have no knowledge that any thing but an odorous principle, and that probably a product formed in the organs of primary digestion, is ever received into the mass of the circulating fluids and manifested in the urine from the Terbinthinate Essential Oils and the Oleïresins. These articles undoubtedly produce all their medicinal effects before they leave the alimentary canal, or before they are decomposed and recom-

posed into new forms by the power of digestion. When quite a large dose is taken at once, it is matter of notoriety that they pass-off by the alvine canal.

It always appeared to me to be a very extraordinary opinion that when *Cantharis* produces irritation of the urinary bladder and bloody urine, it accomplishes this by the passage of particles of its substance through the sanguiferous apparatus, the excretory apparatus of the kidneys, and by means of the urine being brought into contact with, and adhering to the inner surface of the urinary bladder, and thus producing the symptoms referred-to. I think there are facts which abundantly disprove all this. For example, let us suppose that an urgent Strangury, (so called), with bloody urine, is produced by a large Epispastic of *Cantharis* to the inside of the thigh. Now I know from repeated trial, that the most speedy and the most effectual method of relieving such Strangury, is the application of pledgets of lint dipped into a strong aqueous solution of the Sulphate of Oxyd of Morphinum. By experiments and observations which I have formerly made, I do not believe it possible to affect the system at large by *Papaver* so applied. I do not believe that the system at large is as readily affected by *Papaver*, or any other Narcotic applied to a blistered surface or an ulcerated one, as when applied to a sound one. The disease of the surface in such cases disturbs the normal sympathies of the skin with other parts. I do not say this inconsiderately. But what then? Why merely that the Strangury in the case supposed, is only a sympathetic affection of the urinary bladder occasioned by the specific irritation in the blistered part; and *causa sublata tollitur effectus*. The primary irritation is in the blistered part, and the urinary bladder (not the whole system) sympathises with it. It is not necessary to explain here how it happens that the urinary bladder rather than some other part or organ thus sympathizes, since analogous cases of sympathy are well known. It will perhaps be asked here, where is the seat of the primary irritation of the *Cantharis* when Strangury is produced by its being taken into the stomach? The truth is, I have witnessed so few cases of this sort, that I am unable to answer this query explicitly. Of course I should think that it ought to be in the organs of primary digestion, and if so, we should expect that it would have some symptoms in these parts, though as the

irritation in question never amounts to blistering, the symptoms may be comparatively moderate. I do not think that *Cantharis* taken internally in ordinary doses and quantities, is much liable to produce Strangury, since I can not recollect ever meeting with it among my own patients, unless they had been recently affected by an Epispastic. I have known a table spoonful of the strongest Tincture administered by mistake of an attendant without any such effect, though nothing was taken to counteract its operation. The physician judged that it would be soon enough to prescribe for them when the effects began. When a common Honey-Bee stings the helix of the ear, and a Lichen Urticosus appears immediately—to all appearance instantaneously—in the palms of the hands (a case which I have known) is any thing taken-up from the sting and deposited on the inside of the hands? I doubt not that the Strangury and the Lichen are produced in the same manner. It is a defective argument to say with Dr. Paris that “it is easy to imagine that any substance which is capable of entering the current of the circulation and of stimulating the kidneys by a direct application to their secerning vessels may occasion a more copious urinary discharge.” It is easy to imagine a multitude of things, but of what avail in medicine are imaginings that are altogether destitute of proof? Is there any other branch of Natural History except medicine, in which mere imaginings are tolerated at the present day? It is my present belief that the advancement of the healing art has been greatly retarded by the visionary, though often highly ingenious imaginings of great men.

But Dr. Paris is strenuous in favor of judicious discrimination in the adaptation of the appropriate Diuretics to every peculiar case, and in the avoidance of the association of incompatible articles; and yet he associates into one group of Diuretics the actively Antiphlogistic or exhausting Nitrate of Potassa and the equally active Antisbestic or Stimulating *Cantharis vesicatoria*. He supposes that the operations of both of these articles are similar, and therefore if I understand him aright, that they are adapted to the same cases, and are suitable articles to be given in conjunction. It seems to me that a better illustration could not be given of the saying of Shakspeare, that “it is easier to teach twenty men what were good to be done, than to be one of the twenty to fol-

low your own teaching." Those who insist most upon the importance of judicious discrimination, as has often appeared to me, very frequently exercise the least of it. All of these articles except the last two groups (which as Tonics and Cathartics, I do not reckon among the Diuretics) operate as I have already specified directly upon the renes, increasing their secretory or excretory activity. I am thoroughly satisfied that all true, proper and mere Diuretics (in contradistinction from Adenagics) always operate in an analogous, in fact in a similar manner, so that no two of them are even medicinally incompatible, as Dr. Paris supposes. They may be incompatible however, by virtue of different and distinct additional powers which they may happen to possess.

In all probability, the articles specified by Dr. Paris as belonging to this class, are given only as a specimen, for it cannot be possible that such a meager list constitutes the whole of the Diuretics that he employs in his practice, or that he would have others employ. With these articles only, I should not think that the effused fluid of any diversity of cases could ever be removed by Diuresis. It is my present belief that all the truer incompatibilities of genuine and mere Diuretics, and of Adenagic-Diuretics depend exclusively and wholly upon their different and distinct additional powers. In the selection of Diuretics, for particular cases, no article should ever be chosen that has a power whose effects are contraïndicated. For example, I have more than once seen the conjunction of Bitartrate of Potassa and Exogonium Purga prescribed in a universal Hydrops, attended with considerable exhaustion, the whole produced by Diarrhœa chronica, that had been suffered to go-on for several years wholly unrestrained, his family physician not deeming it necessary and much less important to suspend it; though the patient had a constitutional predisposition to it, several of his nearest relations having died of it. I have myself been repeatedly censured by a counsellor so as to cause my dismissal from further attendance upon a case of exactly the same character, because I had not prescribed this same mixture, during less than a fortnight's charge of the patient. The prescribers of this mixture, according to their own statements, expect the Bitartrate of Potassa first to operate as a Diuretic, after which they expect the Exogonium to prove both a dirigens and adjuvans, and to cause Hydragogue-Catharsis. Now it was

one of the first things in relation to the practice of medicine that was inculcated upon me as a professional student, and all my subsequent observation and experience have confirmed it, that Exhausting agents do not operate favorably or desirably in diseases of Exhaustion, and should therefore be considered as contraïndicated in all such cases.

An elderly physician of my acquaintance acquired a high reputation for the treatment of Hydrops by substituting the Alcohol of the shops for Bitartrate of Potassa, in cases in which he was called in consultation. He usually found patients who had been drenched with the above mentioned Salt, though it had often been accompanied by Digitalis, to no purpose whatever. By simply substituting Alcohol for this Salt and giving it freely, he usually produced efficient Uragogy or Diuresis. He preferred the Alcohol of the shops to any other variety of this agent, as a result of observation and experience. Some times he conjoined Tincture of Cantharis with it. In his own private practice, this gentleman usually employed Tincture of Digitalis with Tincture of Cantharis, not infrequently an Infusion of *Aralia hispida*, or of *Asclepias cornuta*, or both, with sufficient success, seldom employing Alcohol along with them. Now if the exhausting powers of Bitartrate of Potassa were understood and considered, it seems to me that no intelligent physician could possibly prescribe it under such circumstances, to say nothing of treating a case with Cathartics that had been produced solely by protracted and unrestrained Diarrhoea chronica, and by Cathartics too that have a strong tendency to produce Nausea, flatus, tormina, etc. and other unkind effects, in all cases to which they are so inappropriate. Some times however, an article may be used which has a power or powers whose effects are neither indicated nor contraïndicated, at least provided such power or powers are not very intense. This may be illustrated by the Euphrenic power of *Nicotiana Tabacum*, which may be neither indicated nor contraïndicated in a given case of Hydrops, and yet may be of no disservice. A sick person may continue to use without disadvantage, even a strong Infusion of Tea or Coffee, to which he has been long accustomed, even though a Euphrenic operation is not indicated. This opinion I have heard controverted but I am satisfied that it is well founded! A medicine having a power that is contraïndicated,

by the condition of the case, provided the disease is a moderate one, and the remedy not very active as respects the contraïndicated power, may be used without any appretiation of mischief from the error, as perceived by non-medical bystanders, and often even by physicians themselves. For example, in a case attended with only a moderate degree of exhaustion, nothing is more common than for physicians to select a Diuretic or Adenagic, which is more or less Antiphlogistic, and this frequently fails of producing the ill effects that we should expect a priori. This is probably to be explained by the circumstances that the case has less exhaustion than it appears to have at one time, or that the remedy has less exhausting power than is imagined. This is undesirable, but cases so treated not infrequently do well, but would doubtless do better if perfectly non-exhausting articles were selected. Some times by way of compensation, for employing such Diuretics in such cases, Antisbestics are conjoined. But this is a bad method. The Antisbestic is very seldom capable of remedying the mischief of the contraïndicated article. Upon the whole however, I never saw *Urginea maritima* and *Polygala Senega* used efficiently in a case of Dropsy without some undesirable sequels, i. e. more or less impairment of the tone of the organs of primary digestion, which it is some times difficult to remedy. As I well know, a less judiciously selected article managed in the best manner, will often do more good than altogether a better article ill managed. There are substitutes for these articles which are greatly to be preferred; but those gentlemen who have always made these two agents the compound basis of all their Diuretic prescriptions, are usually not sufficiently acquainted with other articles to manage them successfully, and therefore they still continue to confine their practice to these two. If different articles are recommended by a counsellor, the patient gets the notion that they are new and consequently they are taken inadequately. In view of such facts, I have some times thought as a counsellor, I would never advise an article which the physician in attendance had not been in the habit of using through very nearly his whole professional career.

It will at once be obvious that such an article as *Cantharis* must be incompatible with Potassa, Nitrate of Potassa, Acetate of Potassa, Bitartrate of Potassa, etc. because *Cantharis* is Antisbestic,

and the other articles are Antiphlogistic. Both Cantharis and the other articles operate in the same manner as Diuretics, viz. by directly increasing the activity of the secretory or excretory action of the kidneys. The incompatibility results intirely from the additional powers associated with the Diuretic power. Cantharis should never be employed except where its Antisbestic and Oresthetic powers are indicated, nor should Potassa and its Salts ever be prescribed except where their Antiphlogistic and Neuragic powers are indicated. An Oresthetic power is as incompatible with a Neuragic one, as an Antisbestic power is with an Antiphlogistic one. If Oleum Terebinthinæ, Copaïfera officinalis, Juniperus communis, etc. are really Antisbestic, as I suppose they are, they must of course be incompatible with Potassa and its Salts, for reasons stated. The fact that Oleum Terebinthinæ, etc. operates upon the kidneys only as a part of a general operation upon the secernent and absorbent or glandular system, and that Potassa and its Salts act upon the kidneys merely, creates no incompatibility. Although Cytisus scoparius, Urginea maritima, Colebicum autumnale, etc. are more or less exhausting when used for their Diuretic operation, yet they are not Antiphlogistic, and are never employed for their exhausting effect, this being always contraïndicated whenever they are used, therefore they are not incompatible with Cantharis or the Trebinthinate Diuretics. On the other hand, they would not be admissible where Potassa and its Salts are truly indicated, because they are not Antiphlogistic; neither would it be proper when they are especially indicated, to accompany them with Potassa and its Salts, because Exhaustion is contraïndicated in all the cases in which these articles are the most proper.

The Mercurials are certainly not well adapted to entonic or phlogistic cases (if there are any such cases of Hydrops) and they do not produce much of any beneficial effect in cases of great atony. It is the intermediate cases in which they operate the best. But in these, further Exhaustion is contraïndicated. They ought therefore to be so managed as to exhaust as little as possible. Of course Exhausting Diuretics are contraïndicated along with them. But when a case happens to be too Atonic for their most favorable operation, or indeed for any operation at all, they may often be made to take effect by the conjunction of Antisbes-

tics or Oresthetics. Digitalis and Nicotiana are neither exhausting nor invigorating, and consequently neither Antiphlogistic nor Antisbestic Diuretics are incompatible with them. I do not know of any Diuretics which may not be conjoined with them. I have often heard it argued that Digitalis and Nicotiana must be incompatible with invigorating, i. e. Antisbestic or Tonic Diuretics, because these two articles diminish the frequency of the pulse. But so do Antisbastics and Tonics themselves, in cases of considerable Exhaustion. Great Exhaustion is usually attended with considerable preternatural frequency of the pulse; and greater or less obviation of such Exhaustion always diminishes the great frequency of the pulse more or less, often very considerably. It is true that Digitalis and Nicotiana diminish the frequency of the pulse by virtue of their Narcotic power, while Antisbastics and Tonics do it by virtue of their invigorating power—quite different modes of accomplishing it, but never the less not at all incompatible modes. There is certainly no incompatibility between any medicinal grade of a Narcotic operation, and any amount of invigoration that can be produced either by Antisbastics or Tonics. But this mere diminution of the frequency of the pulse is called diminution of arterial action, and depression of the circulation, and therefore it is incompatible with invigoration. As appears to me, this is being most grossly misled by words merely. As I have already repeatedly said, diminishing the frequency of the pulsation of the heart and arteries, is not by any means diminishing the strength of action, or the vital energy in any respect or degree, nor is it incompatible with an increase of both; and depression of the circulation applied to the same thing can not possibly mean any thing more or less, or any thing else.

After an intire failure of the production of Diuresis by Digitalis, managed in every possible way that promised success; and then with Digitalis, Urginea and Mercury; the desired effect has at last been obtained to the fullest extent required, by the conjunction of a free use of Alcohol with them, I have often succeeded in producing Diuresis by a conjunction of Digitalis and Cantharis merely. It is true I have often failed of obtaining Diuresis by both of these methods, and by every other that I have ever tried, and perhaps oftener than I have succeeded, though of this last I am not sure, as I have kept no record.

I do not think there is even any incompatibility between the Diuretics on account of the manner in which they increase the excretory activity of the renes, though I doubt not that there are greater or less peculiarities as respects the quality of their impression, as made by every individual or specific article. It is not likely that the Antiphlogistic Salts differ appreciably among themselves in the quality of their impression, though their impression as a group is doubtless peculiar in comparison with other articles. But if these views are correct this difference is not so great as to give rise to any incompatibility.

I have been in the habit of trying all the Diuretics in common use where I have practised both separately and in conjunction, and (bating what results from the possession of different and opposing powers) I have thought that two or three in conjunction always proved Diuretic with considerably more certainty, than when they are used individually. It is of no consequence if powers, whose effects are indifferent to the disease, are mutually counteracted by articles possessing incompatible powers taken in conjunction; though I should greatly prefer Diuretics that would not exert any power upon the disease, which is not positively indicated; but this is not always practicable. The Mercurials are not likely to render much service in cases of considerable exhaustion, even though they produce their ordinary operative effects; and much less likely are they to do good when they do not produce such operative effects. In fact I have often seen the condition of the patient very much deteriorated by them, when a counsellor who prescribed them considered them as rendering great benefit, by means of a moderate amount of Diuresis which they produced. For example a case of Dropsy produced by Chronic Diarrhoea (the Diarrhoea having ceased spontaneously, or having been cured by medical treatment, soon after the Dropsy began) may be stationary or in fact slowly and gradually abating. Very soon however the general exhaustion of the patient is considerably increased; and notwithstanding the greater Diuresis, there is greater effusion also: and the disease is clearly thickening. A counsellor may put such a patient upon Mercurials, *Urginea maritima* and perhaps *Polygala Senega*, with the effect of producing very considerable Diuresis, provided these articles do not operate as Cathartics, at which the counsellor is greatly gratified. One or two such

cases would not enable a physician in attendance to form a certain judgment with regard to the benefit or injury of such treatment under such circumstances : but I have seen it tried so often in this sort of cases, that I now always expect to see the patient worse in no very long time after it : and usually I expect to see him go-down rather soon, notwithstanding the counsellor may think that the moderate increase of Diuresis under the use of these agents affords a favorable augury. Such cases, in my opinion, can not be cured by Diuresis, but they may sometimes be relieved by other and widely different measures. In very many of these cases, the effused and accumulated fluid will disappear slowly and gradually, under such Tonics as *Cissampelos Pereira* ; *C. glaberrima* ; *C. ebracteata* ; *C. ovalifolia* ; *C. microcarpa* ; *Abuta rufescens* ; etc. with the aid of such Antisbestics as *Cantharis* ; etc. and especially Alcohol. In such cases a moderate use of *Papaver* in small doses, at short intervals, contributes greatly to prevent any further effusions—far more than it diminishes the renal excretion, which is so much apprehended from this article by some physicians.

Tonics never increase secretory activity of the kidneys either directly or indirectly, immediately or mediately. They sometimes contribute to improve the general condition of the system and thus render it more susceptible to the proper operation of the Diuretics and Adenagics, or enable the case to recover without them. Very often by contributing to the improvement of the general condition of the system they assist in preventing a renewed effusion of fluid, while that which is already effused is absorbed just about as slowly as the effete solid in health. This is indeed a slow mode of recovery for such a disease, but it is better than no recovery at all. But all this does not constitute a Diuretic operation nor by any means entitle the Tonics to be reckoned as Diuretics. If all classes of remedies that ever assist the Diuretics in relieving Dropsy, or help to prevent the recurrence of the effusion which has once been removed, we should be obliged to merge a large portion of the *materia medica* among the Diuretics.

Cathartics are no more Diuretics than are Tonics. Particular Cathartics may happen to be Diuretic as an additional power, but a Cathartic and a Diuretic operation can not take place at one and the same time. Particular Cathartics, by appropriate manage-

ment, and in appropriate cases, may often be made to remove the effused fluid of Dropsy, by true and proper Catharsis; but then too often repeated Catharsis, in a feeble subject, or (what amounts to the same thing) protracted Diarrhœa, will often produce Dropsy. Injudiciously used, in inappropriate cases of Dropsy, they may aggravate and confirm it. They are never radical remedies for any serious case of this disease. From these considerations, it will be obvious that Cathartics can not with any shadow of propriety, be ranked among the Diuretics.

I do not consider Diuretics or Uragogues as the essential or radical remedies for any disease, neither for Hydrops nor even for a suspension of the secretory action of the renes. I have known more cases of Hydrops recover under the use of Papaver in uniform doses at regular intervals: Iodine managed in the same manner: and Tonics than under the ordinary use of Diuretics and Hydragogue-Cathartics. It appears to me that Papaver contributes powerfully to prevent Dropsical effusion; that Iodine contributes to obviate the morbid condition of the secernents and absorbents; and that Tonics contribute to restore the lost tone in the parts dependent upon the nerve of chymical action nutrition, etc.

I often mention idiopathic Dropsy. This may need some explanation. When a Dropsical effusion supervenes upon a protracted Chronic Diarrhœa, or upon an obvious and protracted organic disease of the liver, or upon a protracted case of Struma, in which to all appearance, almost all of the larger glands of the system are involved, and probably many, if not the whole of the smaller ones (using the term gland here in contradistinction from follicles crypts etc.) I reckon it a symptomatic Dropsy. But when Dropsical effusions take place without being preceded by any other cognizable malady, i. e. any one that has or ought to have a place in nosology, I consider it as idiopathic Dropsy. I do not by any means however consider the mere effusion of fluid as constituting the disease, but only the most obvious and prominent symptom of it. It is my present belief that even in such cases, there is behind the effusion, one or more, probably several morbid conditions in an aggregate, that always precede and occasion the effusion and that may remain after such effusion is evacuated, constantly ready to give rise to a new one. Such condition or

conditions I believe to be the essence of Dropsy, though it may require us to call a case by this name, at a time when no effusion actually exists. I have often had cases of Dropsy in which I have succeeded in evacuating the effused fluid, to all appearance perfectly, several times, without any other betterment of the case. After a time, longer or shorter in different instances, a new effusion would take place; and sooner or later some of the cases would terminate fatally. Now I suppose that after the evacuation of the fluid in each instance, and before its re-effusion, the patient really had the essential part of Dropsy as much as during the existence of the effusion. In nearly all of the cases of what I call idiopathic Dropsy, that I have ever seen prove fatal, the patient has died free of effusion. The effusion of fluid into cavities is only one of the symptoms or effects of what essentially constitutes idiopathic Dropsy; and it is rare that the obviation of one single symptom cures any disease. Some thing beside mere Diuresis and that even sufficient to remove the effused fluid, is necessary for the cure of Dropsy, some thing that will produce an action or condition of a different quality from that occasioned by any mere and pure Diuretic. Although it may be proper to treat here of Dropsy so far as relates to the use and proper management of Diuretics as remedial agents, yet it would obviously be wholly out of place to go on and designate the radical remedies for this disease, either before or after the use of Diuretics, and therefore I leave this subject at this point.

It is a great error to suppose that Diuretics are always indicated in all cases and in all stages of Hydrops; that a case of Dropsy is always benefited by Diuresis however produced, or that a patient will always improve under the Antiphlogistic or exhausting Diuretics, even when they produce their fullest Diuresis. In some cases in which I have succeeded in producing as free Diuresis as could be expected, a reëffusion has taken place as rapidly as the previous one has been discharged. Again when the whole effusion has been evacuated by Diuresis for the time being, it has after a few days, been rapidly reëaccumulated, and so for several times in succession. In several instances I have known patients sink under Diuresis (factitiously produced of course) the sinking taking place gradually in proportion to the quantity of effused fluid discharged, death happening very near the end of the remo-

val of such effused fluid. Before the Diuresis began, the patient was comfortable, as the common phrase is, and not considered in any immediate danger. The Diuretic by whose instrumentality this discharge of effused fluid was effected, was non-cathartic and not considered as having any exhausting power, nor did it disagree with the patient in any respect. In one of the cases taking the course which I have just described, a thorough post obit examination was made, and particularly of the heart, to disease of which, death in analogous cases is so often ascribed; but nothing morbid that was visible was found, every thing being in a state as nearly natural as possible. In one of the cases, to which I allude in the preceding statement, the whole of the effused fluid was discharged by factitious Diuresis, in the course of about twenty-four hours. At the last, the patient went out of the house for the purpose of emptying the bladder, which he accomplished deliberately in the sight of another person, and then fell dead upon a grass plat on which he was standing. Post obit examination revealed nothing in this case; every thing, to all appearance, being perfectly natural except considerable flabbiness of the soft parts. None of the effused fluid remained. I think that this second case had been preceded by Diarrhœa though of this I am not now confident. In these two cases the sudden death was ascribed by most of the physicians to the rapidity with which the effused fluid was carried-off by the Diuresis, and not at all to the Diuretics. In my opinion the Diuretics, though not considered as at all positively exhausting ones, were never the less the immediate cause of death, and this independent of the rapidity with which the effused fluid was discharged though perhaps (but not probably) the rapidity of the discharge was more or less injurious. Even a feeble invigorant, in a case of great exhaustion, will some times prove relatively debilitating to the subordinate parts of the system, that depend upon the nerve of chymical action nutrition, etc. I am quite sure that I have seen a pure though weak Wine increase exhaustion in an exquisitely malignant disease, in which fourth-proof Brandy very little diluted produced its legitimate effects. I never could obtain any evidence that relieving a patient of the burden of one, two or three gallons of non-vital effused fluid, either produced or increased exhaustion; and if the patient is only placed in a horizontal posture, I have never witnessed any

ill effects from its sudden removal. In addition to my own observation, I have obtained a great deal of the best testimony to the same effect, though it is indeed negative testimony. The records of medicine contain testimony to the effect that suddenly freeing a miserable object from filth and vermin has immediately destroyed life. The doctrine was that the sudden abstraction of the stimulus of dirt and lice to which the system had become accommodated did not leave stimulus enough to keep the machine in motion, without time for accommodation to the deficiency. I think that the hazard of suddenly abstracting the effused fluid of Hydrops and of freeing a subject from filth and vermin, must be just about equal.

In such cases I would scrupulously avoid all Diuretics, except Alcohol and perhaps Cantharis, and these I would not give for their immediate Diuretic operation. I would employ Papaver in uniform doses at regular and short intervals, partly to diminish or prevent effusion. I would assiduously give either Cinchona, or some other Tonic of the same general character; or some of the Menispermaceæ, elsewhere mentioned, as peculiarly adapted to Dropsy. I am sure that I have seen some cases slowly and gradually improve and eventually get well, under this plan of treatment, which would have died speedily under Diuretics. It should never be forgotten that mere Diuretics can never do any thing more in Hydrops than barely obviate one single symptom which pathologically is not a primary and perhaps not even an essential one, whatever it may be diagnostically. I have certainly known cases which seemed to be pure and unmixed Dropsy, that after the intire removal of all the effused fluid, retained the whole of the other symptoms being nothing better, with the exception of the obviation of the burthen of this fluid, and so lingered for six months or more finally dying of what I then believed to be the essential part of Dropsy, i. e. this disease minus the effusion. I know of but one other view that can be entertained of such cases, viz. that they are some specific disease, different and distinct from Dropsy, of which the effusion is merely symptomatic, and, not being essential to the disease left it without materially changing its nature or character. But if so, what were these cases nosologically? If they were not essentially Dropsy (though without effusion) I do not know what they were? What

the essential pathological conditions of Hydrops may be, I am unable to conjecture. Of this I must therefore confess my utter ignorance. If there were any remedy or class of remedies, that very generally relieved this malady, it would afford some ground for inferring the pathological conditions; but all the cases that I have ever known recover, had been treated with so many different articles, that no inference in relation to the essential character of the disease could be safely made. I know of no good reason to believe that Diuretics have any well founded claim to be considered as radical remedies for Dropsy since, as would seem, the effusion is only a single symptom, and this perhaps not an essential one.

To assist in forming a correct estimate of the comparative value and deficiencies of Diuretics, I deem it proper to make in this place the following statements, which at first view may seem rather to belong to the general treatment of Dropsy than to the consideration of Diuretics merely. Their therapeutic application however is so exclusively confined to this disease that their value in the *materia medica* may be said to depend almost wholly on their value in Dropsy. If they were to be relinquished in this disease, I do not know where there would be occasion for them, since I can now think of no other serious disease in which they are of any material importance.

On the whole, I think I have seen the greatest benefit in Dropsy from non-exhausting Adenagics of which I consider Iodine as the best; and Tonics of which the species of *Cissampelos* and *Abuta* elsewhere mentioned in this Proëm and *Cinchona* appear to me to deserve the preference. *Papaver* however has always seemed to me to be an important adjunct to the preceding agents, for reasons that have been previously stated. Under a regular continuous use of these articles, I should think that I had seen the effusion of Dropsy slowly and gradually removed full as often as I have ever seen it accomplished by Diuretics. In fact I have seen it considerably oftener. In effusions which are the sequels of *Diarrhœa* whether acute, intense and protracted, or perfectly chronic, I have long since ceased to employ any other method, having ascertained by ample trial and experience the utter inefficacy of Diuretic treatment in such cases. Yet in these circumstances I have always conjoined *Papaver* with the medicines just specified. But the susceptibility of the system to the favorable

influence of these articles is greatly diminished by being preceded by any thing like a persevering course of the exhausting though non-Antiphlogistic Diuretics.

It will at once be obvious that in Dropsy which is the sequel of Diarrhœa we can not expect benefit from Hydragogue-Cathartics, even when the best chosen and the best managed. When these Cathartics remove the effusion, it is only to be immediately renewed in an increased degree and with increased inveteracy: so that, with my present experience of their effects, I should not deem myself justified in trying them again. But these cases, as Dropsies, are to be deemed symptomatic merely. May not the same be the fact with all the cases that yield to the treatment under consideration? All I can say in answer to this question is that in those, which have come under my observation, I have been unable to detect any previous or accompanying disease of which they could possibly be considered as symptomatic. I have certainly succeeded far better in removing the effused fluid of Dropsy by non-exhausting Hydragogue-Cathartics (of a proper sort and properly managed) than by any and all the Diuretics now reckoned in the *materia medica*; so that if I were called upon to relinquish the one set of agents, or the other, I would certainly give-up the Diuretics. The Diuretics that are in the most common use I think may justly be said to be much more precarious in reference to the removal of the effused fluid of Dropsy, than the best non-exhausting Hydragogue-Cathartics. According to my observations, they are also much more likely to exert an injurious influence upon the organs of primary digestion, and upon the system at large, while their operation is at least full as liable to be followed by a reëffusion and I think rather more liable. But as Cathartics, even though non-exhausting ones, can not be repeated beyond a certain number of times (greater or smaller under different circumstances of the case) even those physicians who prefer the Cathartics, usually resort to the Diuretics when they suppose they can no longer continue the Cathartics with prudence, or perhaps safety. In these circumstances I have long suspected that the Diuretics might as well be omitted intirely, and Iodine or other non-exhausting Adenagics, and the Tonics, which I have heretofore particularized, be immediately resorted-to.

As Dropsy is so nearly the only disease for which the Diuretics

are of any material importance, it is thereby rendered more proper to consider this class of agents in immediate connexion with this malady, than it would otherwise be. But the great object is to give as perfect and complete an account of the Diuretics as shall be possible; and if it is necessary to this that their operation and effects should be illustrated by their relations with Dropsy, let us by all means have them.

Much is said of the uncertainty as respects the operation of the Diuretics. It is true that we some times fail of producing a Diuretic effect when we attempt it; but I should think not oftener than we fail of obtaining the operative effects of most other classes of medicines, Emetics and Cathartics excepted. I have often inquired of my professional acquaintance in relation to this point, and so far as respected success in the mere production of Diuresis, their testimony has coincided with my own experience. But we do not always succede in evacuating the effused fluid of Dropsy when we obtain Diuresis; nor do we always succede in curing Dropsy, when we have once evacuated the effused fluid. Success in the production of Diuresis has been far more common, under my observation, than cures of Dropsy. It is not to be forgot that the production of the most free Diuresis is only a single step towards a cure, and that it is always necessary to follow this with what seem to be the radical remedies for the remaining pathological conditions. The mere simple or pure Diuretics, articles which possess no other power in addition, articles which operate directly, immediately and exclusively to increase secretory activity of the kidneys without affecting any other part of the secernent and absorbent or glandular system, are, I believe, invariably rather feeble agents; but if the article selected is of a good quality rightly prepared and managed, and used with sufficient efficiency and if there is no existing pathological condition of any part of the system, which interferes with the production of Diuresis, and over which a true and mere Diuretic can exert no influence, this class of agents (according to my observations) are as certain in their operation and as sure to produce just about a given degree of effects i. e. all the effect they are ever capable of producing under any circumstances, and at any time, as any other class of remedial agents. I do not believe however that mere or pure Diuretics are ever capable of evacuating the effused fluid of any very

serious or very bad case of idiopathic Dropsy and much less capable of radically curing such a case.

As appears to me, a conjunction of two or more Diuretics is always more certain of producing the desired effect than any individual by itself. For example a conjunction of *Asclepias Cornuti* and *Aralia hispida* is as a general rule, preferable to either article alone. I never happened to witness the use of *Digitalis* alone, so universal has been the impression where I have practised medicine, that it is necessary to conjoin some other article with it. On the whole it is a matter of surprise to me that in this age of experiments some of our American physicians have not employed this last agent after the popular mode in England viz. in fact drenching a patient with the Infusion drank ad libitum till there is ultimate Narcosis vomiting and purging. Ray informs us—"Somerseti Angliæ rustica turba hujus" (*Digitalis*) "Decocto Febricitantibus purgationes et interdum super-purgationes et vomitiones humidioribus alvo molitur" ("Lob Ob.") (*Raii. Hist. Plant. Lond.* 1686, *Tom-prim. Lib.* 15, *Cap.* 5, *Pg.* 767. *Sub Digitali.*) A decoction of two manipuli (handfuls) is mentioned by Ray as being taken in the way I have described, not only without injury but with the effect of curing obstinate disease. It ought to be stated here that any thing like active Catharsis is incompatible with Diuresis. Every physician who has been in the practice of his profession for any length of time has doubtless observed that during the full activity of an Acute Diarrhœa there is always a great paucity of Urine. The same is the fact in a confirmed Chronic-Diarrhœa when not at all restrained. On the other hand, as soon as these diseases are regularly and steadily controlled, there will usually be a profusion of Urine, even considerably more than in health.

But there are some Hydragogue-Cathartic-Adenagics which in small doses at short intervals (the whole that is taken in the course of the twenty-four hours not being sufficient to prove Cathartic) will operate as Diuretics. Sooner or later, however, a sufficient amount of these articles will accumulate in the intestinal canal to pass-off by Hydragogue-Catharsis immediately on the occurrence of which, all their Diuretic effect ceases. It will be obvious therefore that such articles can not be relied-on as Diuretics but must be employed only as Hydragogue-Cathartics. It ought to

be known too that when there is great tension of the parietes of the cavities from extreme accumulation of effused fluid it is not to be expected that Diuretics can be made to operate. It seems to be necessary that such tension should be somewhat relieved before Diuretics can be expected to produce their regular effect. This tension seems to hinder the beginning of their operation. Withering says—"if the belly in Ascites is tense, hard and circumscribed, or the limbs in Anasarca are solid and resisting, we have but little hope from Digitalis;" and he might have added from any other mere Adenagic-Diuretic and much more from any mere Diuretic. This is in reality a recognition of the principle which I have just specified, though Withering seems to have observed it only in connexion with one single article. Relief of this tension may generally be effected by a well-chosen and rightly managed Hydragogue-Cathartic. If this does not answer the purpose, Paracentesis will usually do so. After this Diuretics may be employed for the prevention of further accumulation, or the removal of any that has actually occurred.

Incompatibilities among the Diuretics (I would again enforce) are never due to opposition in the qualities of their Diuretic powers, but solely and exclusively to opposition between different and distinct additional powers. But Dr. Paris says truly that "it must be admitted that the failure of the production of Diuresis frequently depends upon their modes of operation's being directly incompatible with the state of the system, at the time of their administration." On this point, I am quite sure that he is right: and I think that this is a more frequent cause of failure than any other. I have often seen cases attended with a great degree of exhaustion of all the parts dependent upon the involuntary motor nerve of chymical action nutrition, etc. treated exclusively with the Antiphlogistic Salts, such as Bitartrate of Potassa and the rest of the saline compounds, that I have shown ought to be associated with it. How can success in the production of Diuresis be expected from such agents, in such a condition of the system? Digitalis, as an Adenagic-Diuretic, will afford a good illustration of the necessity of selecting a Diuretic which is well adapted to the existing condition of the system, for says Withering (the successful reviver of its use in quite modern times) "it seldom succeeds in men of great natural strength, of tense fiber, of warm skin, of

florid complexion, and in those with a tight cordy pulse"—and yet forsooth some have supposed this article to be Antiphlogistic, and adapted only to the treatment of phlogistic or entonic diseases.

Dr. Paris thinks that a frequent cause of failure in the production of Diuresis "in a great measure depends upon the uncontrollable character of the organs upon which they act." I never could perceive this uncontrollable character of this emunctory. On account of the distance of the organs operated upon, from the stomach and upper and smaller intestines, where the Diuretic makes its first impression, we should not expect that this class of agents would operate with the same certainty and speed as Emetics and Cathartics, which make their first impression upon the parts in which the effects produced have their seat; or would operate with the same certainty and speed as the Narcotics, which affect the whole nervous system, a part of which exists in the parts or organs, on which they also make their first impression. In cases under my own exclusive management, I have most commonly (though certainly not always) had perfect success in the production of Diuresis. I consider it as quite an other affair whether the Diuresis rendered any service or not. If the Diuretic has been well-chosen in reference to the peculiar case, and has been given daily with sufficient freedom, and continued for a sufficient length of time, increased Diuresis will very generally take place. This however is rarely to be expected till the Diuretic has been sedulously employed for at least a week, or even more. I have had perfect success at last when to all appearance nothing had been accomplished in ten days. Indeed I have rarely succeeded in the production of any useful amount of Diuresis till after the Diuretic has been used for more than a week.

After the employment of a Diuretic that is ill adapted to the condition of the system for the time being, the next most frequent cause of a failure in obtaining the effect of this class of remedies (according to my observation) has been deficiency in the amount of the article administered daily, and deficiency in the length of time it has been continued. If a case attended with considerable atony (i. e. exhaustion of the parts dependent upon the nerve of chymical action, nutrition, etc.) has been treated for a considerable time with Antiphlogistic or otherwise exhausting articles, it usu-

ally very much lessens, if it does not wholly extinguish the susceptibility to the more appropriate agents and renders the disease much more difficult of management.

The most efficient Diuretics, when taken in an over-dose, have a tendency to nauseate. Now the dose should always just fall short of this point. When such a dose for a given case has been ascertained, and has been continued for a week or more without any positive disagreement with the stomach, it will very frequently nauseate more or less, immediately before Diuresis takes place. Under my own management of Diuretics I have long been in the habit of watching and inquiring for this symptom as an index to the approach of the desired effect; and I have rarely failed of finding it. But I suppose that in all probability this symptom is not to be expected where the dose is not carefully regulated as I have specified. So regulated I consider that there is much greater probability of obtaining the desired effect. If the patient's stomach is irritable as respects the upward peristaltic action, and especially if it has been rendered so by the injudicious use of nauseating doses, it very much lessens the chances of producing such Diuresis as is to be desired. Unless the patient can take about a certain amount of a Diuretic daily, without offense to the stomach, and can continue it for a certain length of time, we shall not be likely to be successful in the production of a useful degree of Diuresis, or indeed any Diuresis at all. Suppose the Adenagic-Diuretic *Asclepias Cornuti* is the article chosen for a given case, unless the patient can take about a pint in the twenty-four hours of an Infusion made in the proportions of two Troy ounces of the root to a pint of boiling water, the preparation being digested at a scalding heat, for at least an hour, the dregs being expressed after straining, nothing as a general rule, will be accomplished with this article. In addition to this, care must be taken that the root is of good quality, i. e. collected in the autumn immediately after the decay of the top, not washed but cleaned with a brush, and not been kept more than one year after its collection. The same remarks are equally true of *Aralia hispida*. This is the general rule, to which, without doubt, there may be some exceptions; but if there are, they prove nothing. With these two articles so managed, I have succeeded as often as with any other, though I need not say that they are not adapted to

every case. Whenever there is any material tendency to Diarrhœa, I should consider this *Asclepias* as inadmissible, though ordinarily it does not operate much if any as a Cathartic when used by subjects who have no such tendency. Although *Aralia hispida* is ordinarily Non-Cathartic, yet I once knew it produce a bad paroxysm of Diarrhœa, in a subject predisposed to such an affection. Such a fact is sufficient to contraïndicate its use in all such subjects. This *Aralia* is Emetic (though not Cathartic) taken in a sufficiently large dose; and yet it is not liable to nauseate when taken as above specified. This effect should always be avoided. Neither of these articles is exhausting if not pushed to the Emetic or Cathartic point, and yet I do not think that they are the best articles for cases attended with very considerable atony. In such cases I should greatly prefer *Digitalis* (by no means an exhausting article, as many erroneously suppose it to be) *Cantharis*, *Spiritus Secalis Juniperatus* and other Antisbestic-Diuretics. I have selected *Asclepias Cornuti* and *Aralia hispida* for illustration, because I consider them as among our very best *Adenagica ad Diuresin producendum adhibita*, and worthy of being employed more frequently than they now are.

Urginea maritima and *Polygala Senega* are also *Adenagica ad Diuresin producendum adhibita*, though belonging to a different Turma. They are quite efficient for the removal of the effused fluid of Dropsy, where there is no material atony; but as they are ordinarily employed i. e. indiscriminately, and without reference to atony at all, I am satisfied that they usually do much more injury than good service. I have now long been in the habit of neglecting them, in favor of other articles that will produce all their desirable effects without their undesirable ones, and as I think have thereby very much improved my treatment of Dropsy. Having mentioned and explained both of the terms *Diuretica* and *Uragoga*, in the beginning of this Proëm as of equal authority, the former being more employed in Britain and the U. S. A. and the latter (as I think) being decidedly preferable it is very remarkable that no synonymy remains.

PROËM TO THE CLASS DIAPHORETICA.

The term Diaphoretica is ancient classical Greek, it being the plural number, neuter gender of an attribute, that signifies *having relation to the excretion from the skin*. It is immediately from a verb which signifies *to perform this excretion*. The term Diaphoresis is also an ancient classical Greek noun-substantive, derived from the same verb, and signifying *the performance of the excretory function of the skin*. The term Hidrotagoga is compounded of an ancient classical Greek noun-substantive signifying *the excretion from the skin*, and an other noun-substantive signifying *that which allures; seduces; leads; or guides*. Hidrosis is an ancient Greek noun-substantive signifying *the acts of perspiration and sweating*; one or the other as the case may be. It is the term for *perspiration* and *sweat* with a kind of magnificative termination suffixed. Hidrotagogia or Hidrotagogy derived immediately from Hidrotagoga would be as legitimate a term as Hidrosis.

Definition.—Diaphoretics or Hidrotagogues are articles which by a direct, immediate and exclusive operation upon the cutaneous and bronchial hydrothermal excretories, restore the elimination of the effete heat of the system in a latent state in combination with Water so as to constitute vapor, when it has been suspended; augment it when it is diminished; and produce an excretion of mere liquid water, when the cutaneous and bronchial hydrothermal discharge was previously in a normal state; and they do all this without any influence upon any other part or parts of the secernent and absorbent or glandular system, and without either increase or diminution of vital energy and strength of action, but merely by an increase of secretory activity.*

*It will doubtless be observed that by the insertion of one word in two places, with a proper connective in each, my definition of this class has been materially modified in comparison with what it is in the Synopsis. (See Pg 420.) This is neither a new view, nor was it omitted in the synopsis by accident. The truth is I was averse to making a Synopsis, on account of just such cases as this, which compelled a material deviation from universally received opinions, without opportunity to explain or defend

Ordinarily Diaphoretics or Hidrotagogues do not appear to change the quality of the Diaphoresis or Hidrosis, except to cause the excretion of mere water not converted into vapor by heat in a latent or combined state. In particular diseases however, there is good reason to believe that the excretion undergoes other changes beside merely an increase of Water. When the quality of the hydrothermal excretion from the skin and bronchial membrane is morbid, Diaphoretics usually change it for the better, at least if they are well chosen ones in reference to the character and intensity of the case. In Typhus putridus it contains some thing which gives it a cadaverous odor—some thing which actually causes it to undergo the putrefactive decomposition and that speedily. In many cases of Rheumatismus acutus, and in articulo mortis, it contains some thing which gives it a clammy and viscid feel. In various other diseases, which might be specified, it undergoes analogous changes; but all such changes depend upon some thing added to it; the heat and the water are always and of necessity the same.

In the course of the subsequent matter of this proëm I shall endeavor to give all the explanation that may be necessary of the function of the hydrothermal excretories of the skin and bronchial membrane, with reference to the animal economy generally, without a knowledge of which the true use of Diaphoresis or Hidrosis, as a remedial process, can not well be understood. This class of remedies has been recognized in the materia medica from the remotest times of recorded medicine, and the names of it are equally old. The limitations and restrictions on the one hand, and on the other, the extension made by my definition, I believe are new.

Strictly speaking, the skin performs only two materially important functions, viz. 1. Keeping together and defending the subjacent parts from all injury; and 2. In conjunction with the bronchial membrane excreting and eliminating the effete heat of the system in a latent state in combination with water constituting vapor. Beside the secernents which eliminate the hydrothermal excretion, the skin contains; 3. Glands which seem to excrete an

them for so long a time. I therefore left out the words in question intentionally, leaving the more perfect definition for the proëm. The definition here given is therefore what I have always considered and still consider as the correct one.

oil-like or sebaceous substance. Perhaps the bulbs of the hairs may be considered as in a certain sense excretories of the skin; but this I mention only to show that none of the functions of this part have been overlooked.

As the lungs are associated with the skin in the hydrothermal excretion, it is necessary to give in this place some account of their offices in the animal economy. The lungs and their appendages certainly perform three highly important functions; viz. 1. In conjunction with the skin they excrete the effete heat of the system in a latent state in combination with water constituting vapor; 2. They excrete the effete Carbonum of the system, presenting it in a nascent state to the inhaled Oxygen-gas of the atmosphere, in which state it enters into combination with it and forms Carbonic-Acid-gas which is immediately exhaled into the atmosphere. These first two emunctory excretions appear to be performed in the bronchial membrane, probably by two distinct sorts of apparatus, both dependent for their motive power upon filaments of the involuntary motor nerve of chymical action, peristaltic motion, circulation, nutrition, secretion and excretion, reproduction, etc. commonly called the great sympathetic nerve. It may be observed here that the latter of these two excretions, though some times evidently diminished morbidly, and perhaps some times increased morbidly, is not commonly considered as being at all under the control of any peculiar class of medicines. At least no direct Anthracagogues are recognized, though it is believed that there are certainly indirect ones. The whole pulmonary apparatus in the aggregate performs still an other function; viz. 3. That of vocal expression, which is mainly accomplished by its constituting the bellows to that curious organ the larynx. As bellows to the larynx, the lungs are an organ of expression, and for their inspiratory and expiratory motions, depend mainly upon the involuntary motor nerves of expression; though they are to a certain extent under the control of the will, and for this purpose all of their appendages (but yet not the lungs proper) receive nerves of voluntary motion.

Even the expansion of the lungs proper for the reception of atmospheric air is certainly not passive, as seems to be generally supposed; since if the pulmonary par vagum of one side is divided, the lung of that side immediately collapses, never to be again

expanded, however perfectly the ribs may be elevated and the diaphragm depressed. Some thing more than a mere enlargement of the thorax is necessary for the proper action of this organ. Again, if the pulmonary par vagum before it reaches the lungs happens to be exposed by a surgical operation, and is subjected in its course, even to such an irritation as is not perceptible by the patient, violent coughing is produced, which seems to consist in quick and short partial expansions and contractions of the lungs, commonly considered as spastic, I will not here attempt to decide whether truly or not. There is a disease now well known, which Dr. J. M. Good first described under the name of *Laryngismus stridulus*, without ascertaining to what its most prominent and principal symptoms and phenomena were due. These have since been ascertained to be occasioned by an irritation of the pulmonary par vagum, by a Strumous enlargement of the glandulæ concatenatæ. The essential symptoms of this are a most violent Cough, very strongly resembling that of *Bex theriodes* or Whooping Cough. Here again, a widely different sort of irritation of the pulmonary par vagum produces quick and short partial expansions and contractions of the lungs proper, with that transient closure of the rima glottidis, that constitutes what is commonly called a Whoop and which depends upon a disturbance of the functions of what is called the recurrent branch of the par vagum. When the par vagum of one side has been divided, the lung of that side is never again capable of being affected with Cough. Assuredly such facts as these prove the positive activity of the lungs proper. Indeed if they have no motive activity, why should they receive a motor nerve? But as they do actually receive one motor nerve, and only one, they must necessarily depend upon this for their motive power. But perhaps it may be asked by what arrangement of muscular fibers, or any thing equivalent, they may be made to produce an active expansion of a hollow organ? I trust I may be excused from giving any rationale of such a process, without derogation to the positive evidence of the facts, till the functions of the spleen, and numerous other physiological problems, that have been so much longer under consideration, have been solved.

In order to keep the bronchial membrane soft and flexible, and in good operating condition, like all other mucous membranes so

called (as if their most important function were the secretion of a little mucus) it is supplied with mucous follicles which secrete sufficient mucus to lubricate it, etc. This mucous secretion from the bronchial membrane seems to be intended for the same purpose as the oily one from the skin, oil being adapted to lubricate an external part, and mucous an internal one. The mucous follicles are likewise dependent on filaments of the nerve of chemical action, etc. for their motive power, as well as the Hydrothermal and Anthracagogue excretions. It will thus be perceived that two of the functions of the lungs are those of emunctories of the system, and one that of an organ of expression. Under the class Diaphoretics or Hidrotagogues, we are concerned only with their first, Thermagogue or Hydrothermal function.

It would seem to be the opinion of many—in fact the prevalent opinion—that the essential function of the first mentioned set of excretories both of the skin and of the bronchial membrane, is the elimination of Water from the system; but a little consideration (as appears to me) must satisfy every one that this can not be the fact, since all the Water that ever passes-off by the skin and the bronchial membrane, might, for aught that we can see, just as well pass-off by the renes. It is true, as I have repeatedly said, that Water enough to keep the skin and the bronchial membrane soft and flexible, may be useful as an excretion from these parts; but this would seem to be a comparatively unimportant purpose. The essence of the operation of the Diaphoretics is therefore a direct increase of the Hydrothermal excretories of the skin and the lungs, without any necessary augmentation or diminution of their power or energy, or in other words, of the strength of their action.

As would seem, it is necessary that the animal system should have the power of generating heat within itself, and of retaining it, under any reduction of the temperature of the atmosphere compatible with life. If this were not the fact, the heat of about 98° F. which seems to be necessary to a due and proper discharge of all the functions could not be attained and maintained, under all circumstances. That the system actually has this power of generating heat within itself, is well known and thoroughly established; and that this power some how depends upon the nerve of chemical action, nutrition and reproduction, I think may be proved

satisfactorily and even conclusively. Through what instrumentality this nerve accomplishes this important effect is not determined. I am inclined to believe that the most prevalent opinion is that the heat produced is extricated by means of some change of composition, the products of which have less latent or combined heat, and perhaps less capacity for free, sensible or uncombined heat (though this latter must be of trifling importance) than the compounds, whose composition has been changed. To me, however, this explanation is altogether unsatisfactory. As I should think, no difference of capacity between different liquid compounds, or different solid compounds, can possibly account for the amount of heat extricated, whatever may be thought of the extrication of latent or combined heat. The conversion or reduction of a gas or a vapor into a liquid might possibly extricate as much; but I have no knowledge that any such process ever takes place within the living animal system. The conversion of a liquid into a solid might possibly extricate as much; but I have no knowledge that this process can be considered as constantly taking place within the living animal system, unless ultimate assimilation is such a process; and even if it is, I can not believe it adequate to the production of the effect under consideration, under all the circumstances, in which it takes place.

In perfect health the heat seems to be produced equally and simultaneously in every part of the system, perhaps with some slight difference between the trunk and the remotest extremities; and this seems to be equally true in fully formed hot Fevers. In fully formed hot Fevers, can it possibly be the fact that there is sufficient ultimate assimilation to account for all the heat? In certain Phlogoses not intense enough, and not extensive enough to affect the whole system very materially, the production of the heat is often very unequal, being commonly much greater in the seat of the Phlogosis than in any other part. This hypothesis necessarily involves an other, viz. that every combination of a solid with Oxygen presented in the form of a gas, is necessarily attended with a very considerable disengagement of heat, whether the whole product of the combination is gaseous or not. For myself, I doubt whether this involved hypothesis is true.

There is a vague notion widely prevalent, that the heat which the system generates so abundantly is extricated wholly in the

lungs, by a sort of combustion of the effete Carbonum excreted, with the Oxygen-gas inhaled; and thence the lungs have been called the "fire-place of the system." This prevalent opinion may perhaps be stated in more popular language, by saying that every thing which is called combustion must necessarily be attended with a great disengagement or extrication of latent heat, the combination of the effete Carbonum of the system with Oxygen in the lungs being of course a true combustion. If this hypothesis were true, the lungs ought to be considerably warmer than any other organ or part; which, I believe, is notoriously not the fact. Is it true however that less latent heat is necessary to convert one equivalent of Carbonum and two equivalents of Oxygen into a permanent gas, than is required to convert two equivalents of pure Oxygen into a gas? At once I answer no. A priori we should naturally suppose that a compound of one equivalent of Carbonum and two of Oxygen would assuredly require more heat for conversion into a permanent gas than two equivalents of Oxygen alone; but such I believe not to be the fact. If there is no error in this view, there can be no heat either extricated or absorbed in the lungs by the combination of the effete Carbonum with atmospheric Oxygen-gas, even though this process should be called a combustion.

If I were to define combustion, I should say that it is such a rapid and intense combination, change of composition or increase of density, as to be attended with a sensible disengagement or extrication of heat and light. According to this definition the combination of the effete Carbonum of the system with atmospheric Oxygen-gas in the lungs, is not a combustion. I doubt not however, that a definition of this term may be made which will include the combination under consideration; but will such a one be a natural one? There may be a definition that will comprehend a Thorn-Apple and a Crab-Apple, and the latter would be about as good as the former. But in order to have any material amount of heat extricated in the lungs during respiration, it would seem a priori as if some gas or vapor must be reduced to a liquid, or some liquid reduced to solid, whereby a large amount of latent or combined heat may be rendered sensible or free. But so far as my knowledge extends no such thing happens. The contrary however would seem to take place. That the Carbonum to be

excreted should be capable of entering into combination with gaseous Oxygen, it must be presented to it in a nascent state, i. e. at the point of separation from some other compound. This, as appears to me, is tantamount to a solid state. But it is exhaled from the lungs as a gas. Now it requires that a very considerable amount of heat should pass into a latent state, to convert a simple solid into a liquid, and a considerable quantity in addition, to convert a liquid into a vapor or gas. If this heat were to be derived from the lungs, they ought to be considerably cooler than any other organ or part, which I suppose can not be the fact. Where then is the source of the heat which converts the effete and excreted Carbonum, not merely into a liquid, but even into a gas? So far as I can discover, this question must remain unanswered, unless we admit that no more latent heat is necessary to convert a compound of one equivalent of Carbonum and two equivalents of Oxygen into a gas, than is necessary to convert two equivalents of Oxygen alone into a gas. Under this view it would not be necessary that the lungs should furnish any heat to convert the effete and excreted Carbonum into a gaseous state.

The effete Carbonum of the system is not, as a simple elementary solid, converted into a gas in the lungs; but it enters into combination with an other element, which is already in a gaseous state; so that the question immediately arises whether the new compound requires more or less heat to render it gaseous, than was required to render that element gaseous, which was already in a gaseous state. If the new compound requires more heat for its conversion into a gas than was contained in its gaseous element, then heat must be obtained from some source or other, and what is called cold will be produced; if it requires less heat, then heat will be extricated or given-out; and if it requires exactly the same quantity, the free heat will neither be diminished nor increased. It is my present belief, though I have referred to no authorities upon the subject, that one equivalent of Carbonic Acid-gas contains no more latent heat than is contained in two equivalents of Oxygen-gas, with which every equivalent of the effete Carbonum combines in the lungs. If this is true, heat is neither extricated nor absorbed in the lungs, by the combination of the effete Carbonum of the system with the atmospheric Oxygen-gas inhaled. None of these considerations appear to me to

furnish evidence, or to render it probable, that animal heat is generated in the lungs, or that the lungs are the "fire-place" of the system, as the language of very many is.

The various considerations already submitted have, I trust, rendered it evident that the lungs are mainly mere emunctories of the system, and that it is one of their offices to eliminate a part of the effete heat, instead of contributing to produce it, and much more instead of being the main or even exclusive organ for its production. But those who have long been in the habit of considering the lungs as the "fire-place" of the system—the part or organ in which animal heat is extricated, and that by a combination of Carbonum with Oxygen-gas—may be unwilling to relinquish their favorite speculation or hypothesis (though I think it hardly merits to be dignified by the latter name) without some plausible substitute for it; but in such a matter I can afford no help.

That animal heat is produced under the influence of the nerve of chymical action, nutrition, etc. I can not doubt, from such facts as I have witnessed, and from such observations as I have been able to make; but from what source it is derived I have never been able to form even a plausible conjecture; and I have no new data on which to attempt one at present. As to the means by which the heat generated in the system, is retained, so as to constitute heat of temperature, that, as appears to me, is sufficiently plain. The living solid has no power of conducting free or sensible heat, or heat of temperature, and therefore all that is generated within the system must needs remain there, till it is carried-off by some other means. If the living solid were a conductor of heat, after the manner of inanimate solids, it is obvious that the system could not possibly retain the temperature of 98° F. at all seasons, and in all regions—a temperature which seems to be essential to health at least, if not to the continuance of life, for any material length of time. But the same heat will not subserve the purposes of the animal economy during the intire period of its natural life, any more than the same Hydrogen, Carbon, Oxygen, Phosphorum, Calcium, etc. The heat generated within the system must be excreted and removed just like the preceding elements; and this heat must be excreted in a latent or chymically-combined state produced by the conversion of some liquid into a vapor, or some solid into a liquid. Now, as would seem, there is

nothing else in the system that appears to be capable of subserving this purpose, except water, and this seems to be admirably adapted to it. A great deal of water seems to be necessary for the system, for mere mechanical purposes. It is necessary, as I have elsewhere said, for moistening the food in the mouth—for rendering it sub-liquid in the stomach—for enabling the crassamentum of the blood to circulate in the blood-vessels—for keeping all the secretions of a proper consistence—for reducing to a solution all the effete matters of the system which are excreted in the form of Salts by the kidneys—for rendering latent and carrying-off the effete heat by the skin, and finally, it is necessary to keep all the living soft parts in a soft and flexible state. It does not appear, as I have already said, that water is ever digested or decomposed within the system; nor that it is ever vitalized and assimilated to the living solid. The fact seems to be different in relation to vegetables. They decompose and assimilate one of the elements of Water, at the least. Now it will be at once obvious that more or less Water is needed by every excretory; and that it could not pass-off as Water, to any amount, without very great inconvenience except by the kidneys. As I have elsewhere stated, there can not therefore be said to be any peculiar excretory for Water; but its presence is necessary at all the excretories, with the exception only of the larger and lower intestines, the excretory of the refuse food. It seems to me to be the only effete matter of the system that does not need a peculiar excretory.

Ordinarily then, the excretion from the Diaphoretic excretories of the skin, and one of the excretions from the bronchial membrane, is the effete heat of the system rendered latent by combination in such a proportion with Water, as to convert it into vapor, in which state or condition, both, under ordinary circumstances, are intirely insensible.

Whether the insensible excretion from the Diaphoretic excretories of the skin is ever wholly and intirely suppressed or suspended, I know not, never having made such researches in regard to it as would entitle me to decide. It would seem to require an air-tight covering for the body, made of Caoutchouc, to enable us to determine in all cases whether the excretion from the Diaphoretic excretories is wholly and absolutely suspended, in a given case or not.

Does not the skin, in certain circumstances, excrete Water instead of vapor of Water? Occasionally Water in its liquid state, appears in considerable abundance upon the skin, either condensed from vapor immediately on its excretion or excreted as a liquid; I am inclined to believe the former. This if suffered to remain upon the skin till it evaporates, operates as a cooling process of the surface, since much heat necessarily becomes latent and insensible when water is converted into vapor. In Glass Manufactories, under active and hard bodily labor in the summer season, etc. the process of sweating seems often to be carried-on in this wise, viz. first, there is a free excretion of the vapor of Water by the hydrothermal excretories of the skin, which of course carries-off the internal effete heat. In consequence of its profuseness, this excreted vapor gives-off its heat of vaporization to the atmosphere and is condensed into Water upon the surface. Again this Water takes heat from the skin and is evaporated into the atmosphere, thereby cooling the skin, but not the internal parts of the system.

But it may be asked, is Water in its liquid state ever excreted by the bronchial membrane? In reply, I would ask, what beside Water in its liquid state, are certain effusions (commonly so called) into the bronchial cells and tubes, that are usually called serous. These take place very frequently in articulo mortis exactly when the excretion of Water as such is most likely to take place from the skin. Although such an effusion into the air-cells and bronchial tubes of the lungs is always indicative of great immediate danger to life, yet I have witnessed a considerable number of recoveries, after a considerable amount of such effusion; indeed after it had extended to a hazardous degree. I think however that Water as such is not always excreted by the bronchial membrane when it is by the skin. No Water is certainly known to be ever excreted by the mucous follicles of the bronchial membrane even in a morbid state; and yet from the analogy of the mucous follicles of the upper and smaller intestines, I should suppose that under certain circumstances they might excrete it, if such an excretion to any material amount into the bronchial cells and tubes were not so dangerous.

There is one affection which seems to be an Acinesia of the nerve of chymical action, nutrition etc. which takes place very suddenly upon some relatively great over exertion, in which, while

the patient is in the very article of death, a considerable quantity of Water or serum as it is called, is effused into the bronchial cells and tubes. This disease, so far as my observations extend, occurs only in those who have habitually a very feeble state of the functions of the nerve, which I consider to be its seat. How long what is called the article of death continues, in this malady, I am unable to say, as I have never reached a patient, fatally affected by it, till all cardiac and arterial pulsation had entirely ceased, though I have always found all the respiratory motions, which depend upon the nerves of expression, quite as perfect as was consistent with a suspension of the sanguineous circulation, and with a copious effusion of Water into the air cavities of the lungs, which must necessarily have taken place rapidly, since I have been with the patient in less than five minutes from the time she was walking actively in the street. All the subjects of this affection, that I have ever known, have been rather corpulent women, who have for a number of years been subject to sudden, slight and very transient attacks of it, during comparative over exertion. When relieved, such relief has always been obtained by an instantaneous suspension of the exertion, by immediately lying down upon a bed, and by taking one or more full doses of Brandy or Tincture of Papaver and Grains of Paradise. All of the attacks, from which recovery took place, have been said to have been attended with a brief cessation of cardiac and arterial pulsation at their outset.

In these cases, as appears to me, there is positively a secretion of a considerable quantity of Water, either from the hydrothermal excretories or from the mucous follicles, as happens in Diarrhœa and Cholera; most probably, I think, from the former. If an other pathological condition did not speedily destroy life, I suppose that such a secretion would soon do it; but if I am under no mistake about the facts of these cases, they prove that either the mucous follicles of all the mucous membranes (so called) may secrete Water occasionally, or that it is done by the hydrothermal excretories. Indeed I think that cases exist in which there is every intermediate grade in the character of the secretion from the mucous follicles between true and proper mucus and positive or absolute Water, though it is true, not perfectly pure.

Thus far I have treated of the excretion from the skin as if it

were pure vapor of Water or pure Water itself; but such is not the fact. The excretion of the skin however, consists of nothing of any material importance except the vapor of Water. It is accompanied with a little greasy-oil, which we should naturally suppose must be secreted by the sebaceous glands, but which some suppose is furnished in part by the sudoriferous glands. It is likewise accompanied by a peculiar and more or less intense odorous matter, whose nature and character has not been ascertained. In most cases it is a little sour, and this is supposed to be ordinarily due to a little Lactic Acid. It is said however to be some times due to Butyric Acid. The excretion from the axillæ and from the feet is said to be some times Alkaline; and this Alkalinity is said to be due to the presence of the Carbonates of Oxyd of Ammonium. In popular language, it is some times said that sweat "tastes salt." This is considered to be due to the presence in it of a little Chlorid of Sodium, and some times a little Chlorid of Ammonium. But all its solid constituents are present only in exceedingly small quantities. It some times contains a little Sulphurous matter (as I suppose, but am not sure) in the form of Sulphihydrous Acid or Protosulphid of Hydrogen. It is said that some times Nitrogen and Carbonic Acid Gasses, in very small quantities, accompany sweat.

From this brief summary of all the substances that have ever been detected in the excretion from the skin, I think it will be evident that its essential office is the elimination of the effete heat of the system in a combined and latent state in the vapor of Water, and consequently for the regulation of the temperature of the living body. Carbonic Acid-gas and the vapor of Water certainly constitute the most important—the essential excretion from the bronchial membrane. One of these substances is the form in which the effete Carbonum of the system is eliminated, and the other the form in which a part of the effete heat that is produced within the system is carried-off. In all probability, there are always minute quantities of several gaseous substances exhaled from the lungs along with Carbonic Acid-gas and vapor of Water; but the number and amount of these is various at different times, and under different circumstances of health and disease, diet and medicine, exercise and rest, sleeping and waking, etc. No one of these adventitious substances is always present, and of

course no one is essential, though possibly some of them may be generally or perhaps always detected if searched for.

The specific nature and amount of the gasses which the blood contains, while its crassamentum is endowed with vitality and is circulating in the sanguineous system, is admitted by the best authorities to be merely conjectural (*Vide Prof. Lehmann's Physiolog. Chim. Lond. 1854 Vol. III. Pg. 328.*) After the death of the crassamentum and in the beginning of its putrefaction, there is a copious extrication of gasses; but the gasses then produced are doubtless specifically different from those existing in the blood during life, as well as far more abundant. At all events their quantity during life is quite small, so that if they are mainly Carbonic Acid their quantity would fall very far short of what is excreted from the lungs. If a part of them is Oxygen we may well inquire what function this gas should perform in the body? If much the larger part of the Carbonic Acid excreted is formed in the lungs by the combination of nascent Carbonum with the Oxygen of atmospheric-air (as is unquestionably the fact) why may not the whole that is excreted be thus formed? I have never read or heard of any method of experimenting, that has been sufficiently precise and accurate to afford any good evidence of the supposed interchange of gasses between the blood and atmospheric-air.

I do not think that the hypothesis of the absorption of Oxygen-gas by the blood in the lungs and the formation of Carbonic Acid, to be subsequently excreted, within the blood-vessels, rests upon the least evidence whatever. Neither do I know of the least ground for the belief that the lungs are the emunctory for any portion of the effete Nitrogen of the system, as some seem to suppose. It was long disputed whether Nitrogen-gas is absorbed or given-out in respiration; and so far as facts are ascertained it is still disputable. Perhaps the blood in the lungs may possibly absorb a little atmospheric-air, just as distilled or any other water will absorb a little, on being agitated; but I imagine that it would be difficult to show that the small amount of air in the blood is not extricated from some of its proximate principles. It is barely possible (but not at all probable) that a little Water may be produced in the blood by some decompositions and recompositions of some of its proximate principles, the necessary Oxygen

being absorbed as a gas in the lungs and the Hydrogen being presented in a nascent state for such combination. This however is so little likely to be the fact, that I should not have thought such a hypothesis worthy even of mention, if I had not heard it advanced by a highly popular medical professor. The blood certainly can not be supplied with Water to any useful extent (if it is even in the minutest quantity) in this way ; and such a process, as appears to me, can not positively take place to any important extent.

Some have supposed that a little Hydrogen-gas and a little Protocarburetted Hydrogen-gas are some times excreted from the bronchial membrane. Expired air not infrequently contains a very small amount—a trace of some compound or modification of Ammid of Hydrogen or of Ammonium. It also frequently contains a very small amount—a trace of certain essential Oils, Camphor, Alcohol, etc. and even of Phosphorum, or some modification or compound of them derived from some of these articles taken as medicines or perhaps in food. A strongly odorous and even fetid principle is some times exhaled from the lungs, always (in all probability) the effect of a greater or less amount of disease. What this may be is utterly unknown. In some instances it has seemed like the odorous principle of what has been called *Oleum animale empyreumaticum*, or Dippell's Fetid Animal Oil ; and this odorous principle is generated from the decomposition of animal matter, and its recomposition into new forms. I think it not at all unlikely that they are the same. As I think, undue importance has been attached to these substances, by those chemists who have not been practitioners of medicine (and all *Medicinæ Doctores*, not to mention *Doctrices*, in this connexion) are certainly not such. Even some practitioners of the healing art have followed this example. The amount of Carbonic Acid-gas and vapor of Water exhaled from the lungs is comparatively so large, while all other substances are so small, in fact so minute in quantity, and so exceedingly variable in amount and relative proportion, as well as in presence or absence, as to evince clearly that they are not essential but only contingent and possibly accidental.

Organized substances are always of such complex composition that it is exceedingly difficult to separate any particular proximate

principle in a state of perfect purity, either by a mechanical or a chemical process; and so it would seem to be, even by a vital process. Every chemist knows how difficult it is to obtain even Alcohol in a state of perfect purity and without any peculiar ingredient derived from the substance which yields it, which will give it a flavor and betray its origin. Just so it is with the excretions from the skin and the bronchial membrane. Though the former is intended to excrete only vapor of Water, and the latter only Carbonic Acid-gas and vapor of Water, yet neither of these are ever quite pure, but always contain numerous impurities in small quantities, from which they can not well be free, since they are themselves menstrua, and therefore can not fail of being more or less contaminated by the various animal-organic principles with which they are necessarily brought into contact.

So many circumstances produce variations in the amount of the vapor of Water, and of the Carbonic Acid-gas excreted from the lungs, that even the average quantity (at least as far as I can learn) given-off in the twenty-four hours has never been ascertained, and probably can not be at present. It is said that about 27.058 cubic inches of Carbonic Acid-gas at 0° temperature, 29.84 Barometer, has been excreted by a vigorous man in the twenty-four hours. It is said that for every volume of Oxygen-gas disappearing from the inhaled atmospheric-air there are only 0.8516 of a volume of Carbonic Acid-gas exhaled. Does not the exhaled air contain considerably more vapor of Water, and does not a certain amount of Carbonic Acid-gas unite with this vapor of Water, the two in conjunction becoming more or less diminished in volume? In brute animals, the quantity of Carbonic Acid increases till they have attained to full development (*Respiration, Lehmann's Phys. Chim. Transl. by G. E. Day, Lond. 1854, Vol. III. Pg. 365.*) The daily quantity of Carbonic Acid excreted by man, increases to about the 40th or 45th year of his age, agreeing mainly with the development of the muscular system. (*Ibidem.*) "It appears (according to Scharling, Andral and Gavarret) that males excrete more Carbonic Acid than females," and that this is the fact even in childhood "for boys eliminate more Carbonic Acid than girls." (*Ibidem.*) "The Carnivora, when kept upon their ordinary food, excrete more Carbonic Acid than the Herbivora, when living upon their ordinary

food." (*Ibidem*, Pg. 367.) Bodily exercise increases the excretion of Carbonic Acid. (*Ibidem*, Pg. 364.) Regnault and Reiset are said to have noticed that "lean animals excrete more Carbonic Acid than very fat ones." (*Ibidem*, Pg. 366.) During hybernation, brute animals excrete far less Carbon than in their active state. (*Ibidem*, Pg. 363.) "Sleep occasions a very considerable diminution in the excretion of Carbonic Acid, as we learn chiefly from the experiments of Scharling." (*Ibidem*.) Rest diminishes the excretion of Carbonic Acid. (*Ibidem*, Pg. 365.) Alcohol, when taken with the food, diminishes the pulmonary exhalation instead of augmenting it." (?) (*Ibidem*.) This last statement I can not credit, since all my observations and experience, that have any bearing on this subject, contribute to prove directly the contrary. In what appear to be torpid states of that branch of the nerve of chymical action, nutrition and reproduction, which presides over the excretion of the effete Carbonum—states in which the essential part of the function of respiration seems to be sluggish, and the decarbonization of the blood is evidently imperfect, the use of Alcohol, under appropriate management, is quite an important remedial agent—in fact one of the most important within my knowledge, very decidedly increasing the excretion of effete Carbonum. Under the inordinate effects of those Narcotics which destroy life by producing an Acinesia of this nerve, as Nicotina, Aconitina, Antiarina (erroneously so called) Digitalina? Cicuta virosa? Cicuta maculata? etc. nothing contributes more to obviate the difficulty than Alcohol so managed as to obtain the greatest amount of its Oresthetic, Euphrenic and Antisbestic effects, without any of its Narcotic operations. With Capsicum and Grains of Paradise conjoined I have known it answer admirably in such cases. Under such circumstances, I really do not know what tolerable substitute we have for these articles. In Dyspnœa exacerbans, in which there seems to be a fluctuating but imperfect and incomplete Acinesia of the same nerve, I have often seen most decided relief produced by a conjunction of Capsicum or Grains of Paradise with Alcohol. This however is a disease that may be relieved in a greater or less degree by various agents; and yet nearly all the medicinal powers that are the most effectual for this purpose, are possessed by Alcohol, viz. Oresthetic, Euphrenic and Antisbestic powers. But

there is more express testimony on this subject than my own, now just mentioned.

We are told that when "Mr. Spalding, the celebrated diver, used a diet of animal food or drank Spirituous Liquors, he observed that he consumed in a much shorter time the Oxygen of the air in his Diving-Bell; and therefore he had learned from experience to confine himself to a vegetable diet, and to Water for drink, when following his profession." (*Murr. Syst. Mat. Med. and Phar. fr. 4th Edinb. Edit. N. Y. 1828. By J. B. Beck, Refrigerants Ch. XIX. Pg. 261.*) In the cases of Acinesia of the Great Semilunar Ganglion and its dependent nerve (as heretofore described) action has some times been restored by Alcohol, Grains of Paradise, Capsicum, etc. The operation of these articles is in fact Anthracagogue in part, since an impairment or even suspension of the function of the decarbonization of the blood is always a part of the Acinesia. Here the Anthracagogue part of the operation of the medicines specified, seems to stand in the same relation to their whole operation, in which the Diuretic and Diaphoretic part of an Adenagic operation stand to the intire Adenagic operation. But it illustrates the effect of Alcohol in the production of Anthracagogue effects as well as if it were a mere Anthracagogue.

This statement in Lehmann's work in regard to the power of Alcohol to diminish the excretion of Carbonum is considered as strongly confirmed by the following additional statement. "Vierordt, like Prout, found that the excretion of Carbonic Acid is both absolutely and relatively diminished even after a moderate use of Alcoholic drinks." "He also confirmed Prout's observation that the increased excretion of Carbonic Acid, which accompanies digestion, is considerably checked by the use of Alcohol." (*Respiration, Lehmann's Phys. Chim. Transl. by G. E. Day, Lond. 1854, Vol. III, Pg. 363.*) If it were not said that the excretion of Carbonum is diminished "even after a moderate use of Alcoholic drinks," I should think that the Alcohol must have been taken to such an extent as to produce a greater or less degree of its peculiar Narcosis. I wish we had been informed in how many doses, and in what quantities, Alcohol may be taken and still be a "moderate use" of it. In reference to a physiological effect, this may be of more importance than seems here to

have been suspected. I consider it a fact that we may employ Alcohol in such a manner as to produce its fullest Oresthetic, Euphrenic and Antisbestic effects, without obtaining any of its Narcotic effects; or we may obtain its Narcotic effect primarily and in such a way as to transcend and supersede its other effects just mentioned, and either of these, by what may be called a "moderate use" of it. Now the Oresthetic, the Euphrenic and the Antisbestic operations of Alcohol are as truly its effects as its Narcotic operation. In fact I never knew it employed in medicine for the last, but always for the preceding. So far as is yet known, Alcohol is incapable of destroying life, except by its Narcotic operation, and as a Narcotic, it destroys life by producing an Acinesia of the great semilunar ganglion and the involuntary nerve of chymical action, nutrition and reproduction, etc. proceeding from it; so that if Alcohol is pushed so far as to produce a Narcotic effect to any material amount, it will clearly diminish the excretion of Carbonum, though when it produces only Oresthetic, Euphrenic and Antisbestic effects (its only medicinal effects) it does no such thing (according to the best evidence before me) but has a contrary operation, since each of these last mentioned powers increases the excretion of Carbonum. The way to obtain the greatest degree of these medicinal effects, without any Narcosis, is to administer the Alcohol in moderate or small doses at short and regular intervals, and to continue such administration for some time continuously. Administering all that is to be taken in a single dose or two, and this so large as to produce speedy and quite positive effects, I should suppose would be liable to produce as much of the primary grades of a Narcotic operation, as of Oresthesis, Euphrænia, Antisbesis, etc. If the manner in which the Alcohol was managed, when the observations were made, had been mentioned, perhaps the diversity in the results of experience might have been explained. At all events, diversity in the results of the experience of different medical gentlemen is often explainable by means of information as to the manner in which medicines are administered and managed.

"Strong Tea according to Prout, exerts precisely the same influence on the respiration as Alcoholic drinks." (*Ibidem.*) "We can not believe that Alcohol, Essential Oils, Theïne" (doubtless meaning certain articles containing this principle) "belong to a

class of substances, which are capable of contributing towards the maintainance of the vital functions." (*Ibidem*, Pg. 262-3.) I can not but think that there is some mistake here in regard to the effects of Tea, Coffee, the Euphrenic, Essential Oils, etc. though exactly where this mistake is, I am unable to say. That these agents as well as Alcohol, Wine, Erythroxyton Coca, Paullinia sorbilis, Catha edulis, Theobroma Cacao, and various other Euphrenics, actually contribute powerfully to support subjects under hard labor, privation of food and rest, exposure to the elements (so called) and all sorts of hardships, appears to me to be too well settled to admit of a denial. The testimony upon this subject is full, unimpeachable and conclusive, and in all probability, has been often verified by a majority of the people of all modern civilized nations. If what I have specified above does not constitute "a contribution toward the maintainance of the vital functions" then I do not know what would constitute such a contribution. Exactly what may be the relative amount of effete Carbonum excreted from the bronchial membrane, when under the influence of these agents and when not, I am unable to say; nor am I acquainted with any facts that indicate whether an increase or diminution of the amount of such excretion, would either hinder or promote the "maintainance of the vital functions" by these articles. There is certainly some discrepancy of testimony among those making observations as to the amount of effete Carbonum excreted by subjects under the influence of these agents; and wherever the truth may hereafter be found, it can not affect facts long ago established by experiments and observations almost without number.

Why may there not be an excessive excretion of Carbonum from the bronchial membrane, under hard labor, privation of food and rest, exposure to the elements (so called) and all sorts of hardships; and if so, why may not excessive excretion be an exhausting process? If this is possible, restraining such excretion might "contribute toward the maintainance of the vital functions." "The latest experiments of Regnault and Reiset on Dogs and Rabbits, show that the respiration of air which contains more Oxygen than the atmosphere, does not produce effects differing from those yielded under the normal relations; the animals did not exhibit any distress from the inhalation of air containing two

or three times more Oxygen than the atmosphere, and the products of respiration were precisely the same as when the animals had breathed atmospheric-air." (*Ibidem*, Pg. 341.) Now I consider the quantity of Carbonic Acid expired as constituting an absolute test of the quantity of Oxygen which disappears from the inspired air, since, as is my belief, all the Oxygen which disappears may be found in the Carbonic Acid. Hence no more Oxygen disappears when an Atmosphere is respired which is half or three-fourths Oxygen, than when ordinary atmospheric-air is respired. There is just about so much effete Carbonum to be excreted, and only Oxygen enough to convert this into Carbonic Acid is required, and consequently only so much will disappear from the air inspired, whether it is all Oxygen or not.

Professor Lehmann says "we should greatly err, were we to regard the lungs simply as organs of excretion, for they differ from other excreting organs, in as much as they not only excrete gaseous bodies, but also absorb certain elastic fluid substances." "An interchange of gasses is therefore effected within the lungs." (*Ibidem*, Pg. 325.) Even in opposition to such high authority I can not but esteem the lungs as simple organs of excretion, with the sole exception of their expressory function. The first, the greatest and most important excretory office, and that in which they receive no assistance, is (as I have already enforced) that of an emunctory of the effete Carbonum of the system. This is absolutely a vital function. The second and less important excretory office is that of an auxiliary to the skin as an emunctory of the effete heat of the system. How far this office of the lungs is immediately essential to life I can not determine. Whether, if this function were to be suspended, the skin would be capable of supplying its deficiency I know not. Now it happens that such a structure of the lungs as best fits them for the office of emunctories of the effete Carbonum and of a part of the effete heat of the system, also best fits them for a bellows to the larynx, and as such, for a highly important organ of expression.

But when Prof. Lehmann says that "we should greatly err were we to regard the lungs simply as organs of excretion," he seems to have no reference whatever to their expressory function; but he supposes that they are absorbent organs; organs of supply to the system. This I can not possibly believe, since I can [dis-

cover no sort of evidence of it, and it is a thing not to be credited a priori that any single and individual organ should at one and the same time be both an organ of waste and an organ of supply. So far as I now recollect, Professor Lehmann does not recognize the hydrothermal excretion of the bronchial membrane and therefore does not consider the lungs as in any degree an emunctory of the effete heat of the system. He considers them vaguely as both absorbing and excreting organs—as absorbing and excreting various gaseous substances, and as would appear, a great many other quite different matters in variable and indefinite quantities, but always in small ones. For myself, I can not avoid the conviction that the function of the lungs is specific, definite and invariable, at least in health, that they excrete all the effete Carbonum and a part of the effete heat of the system and nothing else of any material amount or importance. The few other matters which are excreted under the influence of certain diseases are trifling, and in reality accidental, and of no more importance than the slight impurities contained in the several varieties of Alcohol as obtained from different substances, and which only give peculiarity of flavor, as for example, Brandy, Rum, Apple-Spirit, Peach-Spirit, Date-Spirit, etc.

It will be obvious then that the sole emunctory function of the skin, and a very important function of the bronchial membrane, is to excrete the effete heat of the system; and therefore that both are coolers of the system, and the sole and exclusive ones. As heat in health seems to be extricated at nearly every point of the system, we can easily perceive that the skin alone, and this on the external surface of the body, may not be an adequate emunctory for the whole of it, and that an internal one may be necessary, and this near the center of the system.

Two degrees of a Diaphoretic operation require to be discriminated, viz. 1. Perspiration, i. e. such a moderate grade of Diaphoresis, that the fluid, by means of which the effete heat is rendered latent, is not condensed into drops after excretion; and 2. Sweating, i. e. such an amount of Diaphoresis that the fluid, by means of which the effete heat is rendered latent, is condensed into drops after excretion, yielding its combined heat to the Atmosphere, or to immediately surrounding bodies. It is my present belief that there is in fact still an other grade of Diaphoretic

operation, viz. one in which water as such, is excreted from the skin. Such an excretion would of course carry-off no heat from the internal system, since I know of no reason to think that water ever exists in its solid state within the system, so that none of the effete heat of the system can ever go-off in a latent state, as the heat of liquidity. As the excretion of water as such, by the skin, and perhaps by the bronchial membrane, is never a remedial process, and is never produced by art, that is, intentionally, and especially as there are no medicines known, that are capable of producing it, therefore it need not be treated-of, as a grade of Diaphoresis.

In the Latin language, the term *Perspiratio* denoted only the first grade of the operation of a Diaphoretic, exactly like perspiration in English; while the Latin *Sudor* was always exactly equivalent in import to the English *Sweat*, which is applied only to the second grade of the operation of a Diaphoretic. I do not know that there was any generic term in Latin (any more than there is in English) that included both perspiration and sweat. In Greek, Diaphoresis and its cognate terms are generic, and include both perspiration and sweat, while Hidrosis perhaps anciently denoted sweat in contradistinction from perspiration. Though the noun-substantive, which enters into the composition of Hidrotagoga and Hidrosis, is always explained by the English term sweat; yet I am not apprised that it was ever actually used by the ancients to denote that excretion from the skin which appears in the form of drops of water, in contradistinction from that which passes-off as insensible vapor. At all events I have never met with the terms Hidrotagoga and Hidrosis employed in a sense different and distinct from Diaphoretica and Diaphoresis, which are certainly applicable to both sweating and perspiration in contradistinction from each other. I am not apprised that there is any term in the Greek which is equivalent to *perspiratio* in Latin and *perspiration* in English.

These two grades or degrees of this excretion may often be produced by different quantities of the same agent; but there are undoubtedly some Diaphoretics so moderate in their powers as to be incapable of producing sweating; and possibly (but not probably) there may be some so active as always to produce sweating, at least whenever they produce any effect at all; for

the most active articles of this class will not produce their regular effects under all circumstances and in all conditions of the human system.

Many of the Adenagics are commonly confounded with the Diaphoretics or Hidrotagogues, as well as with the Diuretics or Uragogues; but they differ in more respects than will be at once perceived from the definitions of the Diaphoretics and the Diuretics merely, without reference to the definition of the Adenagics also. The Diaphoretics and the Diuretics beside acting exclusively upon a single excretory and increasing its activity, do nothing else; while the Adenagics not only increase excretion when it is deficient, but they often diminish it when it is excessive, and change its quality when it is vitiated. The evacuations which the Diaphoretics and the Diuretics produce are an important if not the sole object of their administration; while any evacuations which the Adenagics (when given as such merely) may incidentally produce, are of little, and often of no medicinal value. And yet when the Adenagics are used as Diaphoretics merely, or as Diuretics merely, the evacuation becomes of the same medicinal importance as that of a pure Diaphoretic or a pure Diuretic. But the Adenagics should never be used for their Diaphoretic or Diuretic operation merely, when any of the other parts of their Adenagic operation are contraïndicated. I believe that almost every Adenagic inclines to operate more especially upon one excretory than upon an other. It will be obvious that an Adenagic that inclines to operate more especially upon the kidneys, should not be selected for the purpose of a Diaphoretic, and vice versa. Reference should always be had to such facts in the selection of an Adenagic for the purpose of a Diaphoretic or a Diuretic. However if an article is well selected; if the most perfect Diaphoretic or Diuretic regimen is employed; and above all, if the article is accompanied with a pure Diaphoretic or a pure Diuretic as a dirigens, even though a feeblér article than the Adenagic, no other excretory but that which is desired to be, will be very much affected. If the article has other different and distinct powers beside that of an Adenagic, these will of course be exerted; and if they are contraïndicated, they may do much mischief.

It has been customary, time immemorial—and is so still with

many pathologists—to assign a suppression of the excretion from the Diaphoretic excretories of the skin, as the essential, and even the sole cause of very many diseases. It is unnecessary here, and it would be tedious at this time, to enumerate one-half of the diseases that have been supposed by different authors and different practitioners of medicine, to be occasioned in this way. It will be sufficient to mention a few, as for example, Diarrhoea, Cholera, Catarrh, Dysentery, Rheumatismus, Rheumatalgia, etc. Such pathologists commonly make the restoration of the excretion from the Diaphoretic excretories of the skin the primary indication of treatment, not only in the diseases just specified, but in numerous other diseases supposed to be occasioned in the same manner. For myself, I know of no evidence whatever, that the suppression of the excretion from the Diaphoretic excretories of the skin is the essential cause of any single individual disease: nor do I believe that such is the fact even in a single case. That irregularities, excesses and deficiencies, of what are quaintly called the non-naturals—a name which I employ for want of a better—I think that I very well know, not infrequently stand in the relation of a procataretic cause to numerous diseases; and, among them irregularities, excesses and deficiencies of the secretions and excretions. But in this connexion, it must be remembered that a procataretic cause never affects the nature and character of a disease in any manner or design; and of itself, and alone, never produces any disease, but only kindles into action any and every disease to which there may be a predisposition. A predisposition is as positive a state as any disease, and a procataretic cause converts this state into some specific malady which may be prevalent, either as an endemic or an epidemic.

The following are some of the cases in which the excretion from the Diaphoretic excretories of the skin is either very much diminished or perhaps some times wholly suspended. It seems to be diminished normally, to a greater or less degree, by exposure to great and unaccustomed cold. This is necessary to enable the system to preserve the necessary temperature. It seems to be very greatly diminished—perhaps wholly suspended—immediately on the attack of certain malignant sorts of Typhus, of the nervous type, in which the whole surface of the body is as cold as a corpse, and possesses the power of conducting heat as perfectly

as a marble slab. It seems to be very greatly diminished—perhaps wholly suspended—by the existence of colliquative Diarrhœa or colliquative Cholera. In these diseases, there is a very great diminution—if not an intire suspension—of the production of heat within the system, and a diversion of all the effete water to other excretories beside those of the skin. It seems to be very greatly diminished—possibly some times suspended—by the existence of exquisite and very profuse Paruria Diabetes, which seems to diminish the production of heat very greatly, as well as divert the effete water of the system to an other excretory. I do not pretend that these are all the cases of a diminution or suppression of this excretion. I only mention them as specimens. In none of the cases thus far mentioned, does it seem to be a primary indication, to restore or augment the excretion from the Diaphoretic excretories of the skin, till, by the obviation of the other pathological conditions the normal excretion from the skin becomes admissible and would be useful. The excretion from the Diaphoretic excretories of the skin seems to be very considerably diminished, if not actually suspended, in many of the hottest cases of Typhus putridus; but are not all the other continuous secretions as much diminished as that of the Diaphoretic excretories of the skin? It is my belief that they are. Under a diminution, or possibly a suspension of all the fluid secretions, that are of a continuous character, we should suppose that Adenagics, rather than Diaphoretics, would be indicated.

From a careful consideration of the physiology of Diaphoresis, we should hardly expect it to be of any material service, except for the obviation of an inordinate production of heat in the animal system. For my own part, I am of the opinion that the therapeutic value of the Diaphoretics has always been very greatly overrated; and that the benefits which they are commonly supposed to render, are often attributable to other powers possessed by the articles employed as Diaphoretics. In many cases, articles which are really and truly Adenagics are considered and employed as mere Diaphoretics, and thus the benefit of Adenagy is ascribed to Diaphoresis. In very many cases, some preparation or composition of Papaver is employed as a Diaphoretic. Now this agent is a true and proper Diaphoretic, and one of the most effectual agents of this class. It possesses however other, and

far more important powers—powers that are of far more remedial value than its Diaphoretic power.

An article can not operate both as a Diaphoretic and Diuretic at one and the same time ; but an individual article may possess both these powers. They may even reside in the same proximate principle. Whenever Diuresis is much increased, Diaphoresis will always be diminished ; and vice versa, when Diaphoresis is much increased, Diuresis must inevitably be diminished. If Diaphoresis is indicated and attempted as a cooling process, there should be no Catharsis attempted at the same time, since this process is incompatible both with Diaphoresis and Diuresis. Catharsis always diminishes both Diuresis and Diaphoresis.

The opinion that sweating is a remedial process for Fever generally, doubtless originated when Fevers were generally phlogistic. But even phlogistic Fever does not consist in preternatural heat merely, but in numerous other pathological conditions, most of them of greater importance than preternatural heat. In Fevers of this character it is true that cooling is required ; but mere sweating even if it could be produced, would be utterly inadequate to accomplish this purpose in these diseases. But none of the simple and pure Diaphoretics will operate in any material degree of this diathesis. Antiphlogistics and these alone will accomplish the desired purpose, and they do it only indirectly, by obviating entony, on which sweating takes place spontaneously. After the origination of the notion that sweating is remedial of Fever generally, physicians seem to have continued to employ it even in cool Fevers, where it is by no means indicated, and where it can render no possible service.

It is commonly said by authors on the *materia medica* that all Diaphoretics are Stimulants, Excitants or Incitants, and that they prove Diaphoretic merely by virtue of Stimulation. Increased action is necessarily Stimulation say they. Now I esteem this reasoning grossly fallacious. Increased frequency, increased activity and increased strength, are all here confounded. For example, the production of increased frequency of the pulse is not Stimulation. I have known the pulse increased to two hundred beats in a minute, by extreme loss of blood. Who will pretend that this is Stimulation ? The production of increased activity is not Stimulation. In the last stages of Paruria Diabetes, there is

greatly increased secretory activity of the renes; but who will maintain that this is Stimulation? In a protracted and greatly exhausted case of *Blennorrhœa vaginalis*, there is greatly increased secretory activity of the mucous follicles of the vagina; but can this be considered as Stimulation? Neither is a mere increase of susceptibility, such as is produced by the Oresthetics, Stimulation; though a Diaphoretic, as a different and distinct thing, may be associated with an Oresthetic power. In truth, nothing can properly be considered as Stimulation, except the production of increased strength of action (i. e. Antisbesis) which is not at all essential to a Diaphoretic effect; though some true and proper Stimulants (i. e. Antisbestics) possess in addition a Diaphoretic power, and consequently can be appropriate only in more or less atonic conditions of the system. As examples of Antisbestic-Diaphoretics, we may mention Alcohol, *Vinum Vitis-Viniferæ*, *Papaver somniferum*, etc.

In some cases, great exhaustion hinders Diaphoresis, and then the Antisbestic power of these articles assists in the production of Diaphoresis by obviating in part the hindering exhaustion. There are cases in which, apparently from a great deficiency of vital energy in the secernents and absorbents, they seem to be incapable of resisting the *vis a tergo*, and consequently pour forth a greatly increased quantity of an imperfectly elaborated secretion. This some times happens with the Schneiderian, the faucial, the bronchial, the intestinal and the vaginal mucous membranes. It would seem likewise to happen with the serous membranes. Good's *Melæna cholæa* and *Melæna cruenta* would seem to be of this character; as are some of the uterine discharges which are intermediate between the normal secretion and a positive Hemorrhage. I believe it occurs less frequently with the hydrothermal excretories of the skin, but some times with them. Some of the crude sweats that are so difficult of cure, have seemed to me to be of this character. It may be considered certain therefore that increased secretion and excretion do not involve Stimulation in the sense of Antisbesis, and of course, that a Diaphoretic operation does not involve this effect.

On the other hand, entony or phlogistic diathesis some times hinders Diaphoresis, and then a Diaphoretic that has in addition an Antiphlogistic power, will be found to be the most appropri-

ate. I think that there may be deficiency of Diaphoresis in connection with entony; in connection with atony; and in connection with irritation; and in connection with torpor or insensibility; and such combinations of these as are not pathologically incompatible. In many cases where Diaphoresis is indicated, neither Antiphlogistication nor Antisbesis is required, and a Diaphoretic should be selected in conformity. In mere and pure irritative deficiency of the hydrothermal excretion from the skin, neither the exhausting and Antiphlogistic Diaphoretics on the one hand, nor the Antisbestic ones on the other, are peculiarly appropriate, but cases of this sort will usually tolerate either; and if they happen to be conjoined with more or less Papaver, both will answer tolerably well. If there is no error about these views, it will be obvious that Diaphoretics should be selected in conformity with them.

From what would seem to be the prevalent notions of physicians, judging from their theoretical views, we should infer that no articles except Antisbestic are commonly employed as Diaphoretics, while from observation of their actual practice, it would appear as if no articles but Antiphlogistics are in fact employed for this purpose. According to my observation of the ordinary practice of most physicians, Tartrate of Antimony and Potassa is the article much the most employed in all sorts of cases as a Diaphoretic; and next to this Cephælis Ipecacuanha. Now I have long been satisfied that the first has no true Diaphoretic power whatever, while it is an efficient exhausting agent; and that the second is equally destitute of any Diaphoretic power, and only feebly exhausting, i. e. not sufficiently so to be positively Antiphlogistic.

In the early part of my professional course, I began with the use of Tartrate of Antimony and Potassa as my chief Diaphoretic, in nearly all cases in which Diaphoresis was indicated, because this seemed to be the recommendation of books, and was the usage of the physicians by whom I was surrounded. Soon however my own observations induced me to doubt whether this article produced the effect for which it was employed. In fact, I had been better instructed; but for a time I followed books, and the practice of my neighbors, instead of better instruction. I next resorted to Cephælis Ipecacuanha for the same purpose.

But by this time all our diseases had become regularly atonic, and I found as much reason to doubt the Diaphoretic power of this latter article, as of the former. I next began a systematic course of comparative trials of these two articles as Diaphoretics. I used each of them efficiently for three or four days in succession, and then abstracted them for the same length of time (if the case continued long enough) again returning to them, the same practice in all other respects being employed through both periods. These trials I repeated a great number of times in my own exclusive practice, as well as in cases which I attended in consultation. The general, indeed almost the uniform result was that I found Diaphoresis take place much more easily when neither of these articles was employed. In fact, I found some cases in which Diaphoresis could not be produced under the use of these agents, when it would take place very readily if they were wholly discontinued. Subsequently I had opportunity to observe that the patients generally, of all those gentlemen who use these agents the most freely are the most liable to dry skin. Not infrequently have I been called in consultation to prescribe for cases in which there was a remarkably dry skin, which speedily became soft and moist after abstracting the Tartrate of Antimonia and Potassa or the Cephælis Ipecacuanha, which ever might have been employed.

It must be observed that these trials were all made in atonic diseases; and that I invariably found Tartrate of Antimonia and Potassa a greater hindrance to Diaphoresis than Cephælis Ipecacuanha. When, in consultation I find an obstinately dry skin, I always conclude that it is due to an efficient use either of Tartrate of Antimonia and Potassa or of Cephælis Ipecacuanha; and I do not now recollect ever to have found myself mistaken. Consequently, I advise the discontinuance of these agents, and almost always the skin becomes soft and moist. If the use of these articles is resumed the skin usually becomes dry. This has been the result of many years' observation. After arriving at these results I communicated with a number of my professional friends and acquaintances upon the subject. I found several of the older ones who had arrived at the same conclusion as myself, and a much greater number who had intirely discontinued the use of these two agents in the then prevalent diseases, because (as they said)

they did not seem to be useful, though they had not arrived at my conclusions in manner and form.

Some time previous to this, I had become satisfied that the Sulphate of Potassa contained in what is commonly called Dover's Powder was often injurious in the then prevalent diseases, and I had accordingly abandoned that preparation and substituted a mixture of Vinum Cephaëlis Ipecacuanha and Tincture of Opium, in the same relative proportions as in Dover's Powder. After employing this for some time, I found the proportion of Cephaëlis too great, and therefore I diminished it and kept diminishing it till I got rid of it intirely. I then contrived a substitute for Dover's Powder, in ten grains of which there was one grain of Opium and three grains of Camphor, the remainder being a mixture of equal parts powder of the root of Glycyrrhiza glabra and prepared soft Carbonate of Calcia. The last two ingredients were added to prevent the other two from concreting into minute masses, to render the Camphor less volatile, to cover the taste of the Opium, and to give the whole such a bulk as would allow it to be divided into suitable doses for small children. After the salts of the Oxyd of Morphinum became sufficiently common, I substituted a sixth of a grain of the Sulphate, for the grain of Opium in this preparation, which now constitutes a far more eligible preparation than the old Dover's Powder. I have never known any one to give it a fair trial, who did not prefer it to Dover's Powder. So extensively has its use spread that I have heard of its employment in several of our Southern States, and even in Asiatic Turkey.

Even as distinguished a practitioner as James Johnson says—“now that the principles which govern the perspiratory process are better understood,*the long and endless farrago of sweating medicines is reduced to a few neutral salts” (very evidently meaning Antiphlogistic, instead of neutral) “as Citrate of Potassa, Acetate of Ammonia, etc. accompanied occasionally with small doses of Antimony.” “These with cool diluent drinks, are the only safe or salutary Diaphoretics in Fever.” (*James Johnson on the Influence of Tropical Climates on European Constitutions. Vol. I, Part II. Spec. Diseases. On Fev. in gener. Pg. 64, Lines 4 to 12. Philad. 1821.*) If a course of Antiphlogistic Diaphoretics constitute Stimulation, it may be laid-down as a rule of

practice that all phlogistic diseases may be well treated by Stimulation, and in fact that all remedial treatment is Stimulation. It will be obvious that what so palpably proves too much, really proves nothing at all. It is in vain to attempt an evasion of these principles (as I have often known to be done) by contending that whatever makes a sufficiently strong impression upon any part of the system to change the condition and produce a new action, must necessarily be Stimulant, since in such an acceptance of this term, (as I have elsewhere shown) every remedial agent or process would be Stimulant, and the word would become more general than the word medicine. If the term Stimulant is used in a more limited sense to designate a particular class of remedies in contradistinction from every other class, this signification must be adhered-to, if we would be intelligible, and avoid the most palpable fallacies.

For the purpose of producing Diaphoresis or in other words, augmenting the hydrothermal excretion, either mere and proper Diaphoretics are employed, or those Adenagics, which, by a certain regimen, can easily be made to operate more especially upon the hydrothermal excretories of the skin and of the lungs, and consequently, in the lists of the Diaphoretics actually employed, there is a promiscuous mixture of mere and pure proper Diaphoretics, with the most unequivocal Adenagics, and many articles belonging to neither of these classes. It may however be useful to enumerate in connection with the Diaphoretics all the Adenagica ad Diaphoresin producendam adhibita.

It is very frequently the fact (as I have already shown) that mere Antiphlogistics are employed as Diaphoretics. I have often also known mere Nauseants and Emetics employed as Diaphoretics. Neither of these powers, when pure, ever prove directly Diaphoretic; and yet articles of such a character merely are often associated indiscriminately with mere and proper Diaphoretics. If every article capable of obviating any morbid condition, which, in a given case may happen to hinder Diaphoresis, were to be associated with the Diaphoretics, this class would comprehend a large portion of the *materia medica*. This would be as proper as to associate mere Antiphlogistics and mere Emetics with them, because in certain conditions of the system, these classes of agents obviate morbid conditions, that hinder Diaphoresis, and so con-

tribute indirectly to its production. I have often known physicians give an active Emetic of Cephaëlis and Tartrate of Antimony and Potassa, whenever a patient had a dry skin, and without regard to the specific nature of the disease or the degree of exhaustion existing at the time. By the very violence of its operation and by the additional exhaustion which it produced, the patient would often be drenched with sweat toward the latter part of the process; but when the Emetic operation had passed by perfectly, the patient would be as dry as ever, and often much more so. Such an operation does not by any means prove the least degree of true and direct Diaphoretic power. I have repeatedly seen a patient thus vomited as often as every other day, for three or four times in succession, in Dysentery, when (as I doubt not) a proper use of Papaver, and some times Brandy, would have kept the skin as moist as could have been desired. Again, I have seen patients Antiphlogisticated through the whole of a Typhus, because the skin was dry, when I had good reason to feel absolutely certain that a suspension of the Antiphlogistication, and a proper use of Papaver, would have made the skin moist enough.

Much is said by very many members of the medical profession about producing "a determination to the skin," and this is considered as equivalent to the production of Diaphoresis, or as a means of producing it, and consequently "to determine to the skin" is to produce Diaphoresis; and vice versa, the production of Diaphoresis is "to produce a determination to the skin." And yet, if inquiry is made of these gentlemen, independent of especial reference to Diaphoresis, what they understand by "determination to the skin," the answer will be "the transmission of a greater relative quantity of blood to the capillaries of the skin."

- If in addition, but in immediate connexion the inquiry is made whether this is equivalent to the production of Diaphoresis or sweating, the invariable reply to me has been in the affirmative; for I have repeatedly asked these very questions. Now it has always seemed to me that such replies have been extorted by previous admissions, or perhaps previous positions. I never could believe that a greater relative transmission of blood to the capillaries of the skin, could either constitute Diaphoresis or sweating, or be a means of the one or the other; and consequently I have

always suspected that there must be some thing in the views and opinions of these gentlemen which I do not fully understand. As appears to me, Diaphoresis has no sort of connexion with "a determination to the skin" in the sense just specified. In phlogistic diseases there is always "a preternatural determination to the capillaries of the skin" yet there is no Diaphoresis. Indeed there are no other diseases in which the skin is so obstinately hot and dry. In order to produce Diaphoresis in diseases of this character, it is always necessary to obviate the "determination to the skin;" and all the most appropriate remedies for phlogistic diseases actually contribute to produce "a determination of blood from the skin" and to the viscera. This is eminently the operation of Depletion of Blood, Catharsis, Antimonials and the Antiphlogistic salts generally. It seems strange to me that any person entertaining the notions under discussion in regard to Diaphoresis, should ever reckon Antimonials as Diaphoretics; and yet I believe that such persons always talk of Antimony's "determining to the skin;" and consider this as equivalent to calling it Diaphoretic. But it neither "determines to the skin," nor is it directly Diaphoretic—two things which I consider as materially and essentially different. In a positively atonic disease however, in which there is always a general preternatural "determination of blood" from the skin and to the viscera, the production of a greater relative determination to the skin, in as much as it diminishes the general morbid condition, contributes indirectly to assist any efforts that may be made for the production of Diaphoresis; but directly it does not contribute a particle towards this effect. In non-phlogistic and at the same time non-atonic diseases, the production of a preternatural "determination of blood to the capillaries of the skin" is generally and I think invariably an obstacle to Diaphoresis, because the addition of a disturbance of the balance of the mass of the circulating fluids, particularly in the skin, to the previous morbid conditions, heightens the burthen of disease, and of course increases the difficulty of Diaphoresis. It must not be forgot that (as I have already inculcated) the diagnostics—indeed the essence of a proper and true Diaphoretic operation is directly increased activity of the hydrothermal excretories of the skin and bronchial membrane, without any increase of strength of action, or any influence upon the rest of the secer-

nents and absorbents, as a necessary antecedent, accompaniment or consequence.

I have long been satisfied that any material sweating in Typhus nervosus (the most common species of Typhus occurring in New England) for example, is on the whole injurious rather than serviceable; and of course, I have long ceased from making any efforts to produce it. If a case of this disease is treated in what I conceive to be the best manner, from its outset; and especially if Papaver is judiciously employed, I believe there is seldom if ever any troublesome degree of dryness of the skin. If Tartrate of Antimonia and Potassa, and other Antiphlogistics, are much employed in its early stages, there will often be a very obstinate dryness, or some other equally troublesome condition, either immediately connected with or resulting from a very undesirable degree of the exhaustion, with which the disease began.

Some physicians always attempt to produce free sweating in Catarrhus communis, whether of the sporadic or epidemic variety, when ever the case is serious enough to require medical treatment. In many cases, where I have known this practice adopted, I have not indeed perceived any ill effects from it; but in many other instances, I have seen this disease, to all appearance, converted into really unmanageable and bad maladies; and occasionally, though rarely, as has seemed to me, they have been decided fatally by this measure. This will not appear surprising when it is considered that medical aid is not called-for, in these varieties of disease, unless they are intense and thought to be more or less dangerous, by the family and friends of the patient. The patient is much less likely to appreciate the real severity and hazard of the case than the bystanders.

Some consider sweating as the main remedy in Pneumonitis Typhodes of every species, but more especially in Pneumonitis Typhodes-notha. In this species I have known a patient sweated till his bed was wet intirely through. I am unable to say however that I ever witnessed any appreciable benefit from this process, in this disease; though not infrequently I have seen decided harm result from it. I have known a patient sweated in Pneumonitis Typhodes-Phlegmonea till it had degenerated into what James Johnson calls Mediteranean Phthisis; and in Pneumonitis Typhodes-Catarrhalis till it had degenerated into what is called

Catarrhal Phthisis. Under my observations physicians have not been very much inclined to employ the process of sweating in Pneumonitis Typhodes-Erythematica, since, in many cases, the symptoms are almost too formidable to allow any practitioner to wait for the effects of such a measure. I never happened to see a case of Pneumonitis Hectica-Rheumatica, whether by metastasis, or primary misplacement, in conjunction with any other physician; and in the few cases, with which I have myself met, I did not even think of the process of sweating in connexion with them; so that I know nothing of the effects of this measure in these diseases.

I have been acquainted with physicians who considered sweating as very nearly a specific in Enteritis Typhodes-Dysenterica *vel* notha or Dysentery. As is well known, the process of sweating is very highly recommended by Dr. Benjamin Moseley in this disease. I have actually witnessed cases of Dysentery treated by an Emetic of Cephaëlis and Tartrate of Antimonia and Potassa, either every day, or every other day, with Diaphoretic regimen in the intervals, for the purpose of producing sweating. If the Emetics did not prove Cathartic, a dose of Oil of Ricinus was employed also in the intervals. The results of this practice, as I had opportunity to witness it, under the direction of others, never commended it so much to my judgment as to induce me to give it what would be considered a fair trial, and much less to adopt it. I once attempted to execute it to a certain extent for another physician, in one of his own cases, that he was unable to visit as often as was necessary; but I made so many deviations from it according to my own judgment, and indeed with the assent of the physician to whom the case belonged, that it could hardly be said to be a trial of the plan in question. Besides in this case the Sulphate of Zinc and the Bisulphate of Alumina and Potassa were more used (as according to Moseley) than Cephaëlis and Tartrate of Antimonia and Potassa. Under my own observation, and as the result of much testimony, some of it from practitioners in New England, in the middle and Southern States, in the West Indies, in Guiana, in Guaiacul, etc, those epidemics of Dysentery that are naturally attended with sweating, are among the worst and most unmanageable that occur; and those in which profuse sweating is produced and kept-up factitiously are thereby more or less assimilated to them in character and ob-

stinacy. Dr. Theodore Woodward of Vermont, a highly intelligent practitioner and of much experience in this disease, once informed me that of all the epidemics of it, which he had ever witnessed, those attended with sweating throughout their whole course were assuredly among the worst that he had ever seen. It was likewise his opinion that any thing like free and protracted factitious sweating always produced deterioration of the condition of the case. An English physician more than sixty years of age, who had spent his whole professional life in Guiana expressed almost the same opinions to me. He said that epidemics of Dysentery attended with profuse sweating from their very outset had often occurred under his observation; and that they were always peculiarly difficult of treatment, and an unusually large number of the cases were liable to prove fatal. I have dwelt more upon this topic because I have known a considerable number of physicians, who, if they did not adopt the hypothesis that Dysentery is "a Fever turned inward," certainly treated it as if this was their confirmed opinion.

Cholera is a disease in which sweating has been considered by many as an important remedial measure, indeed almost a necessary one; but, in any serious case of this disease, I believe it will always be found impossible to produce any other sweating, except that which takes place in articulo mortis, till the disease is under thorough restraint, at least for the time being. But if the disease is kept under such restraint for a certain time, the hydrothermal excretion from the skin and bronchial membrane will very certainly be restored spontaneously.

In Diarrhœa as well as in Cholera, it has also been deemed important to produce sweating; but till this disease is under effectual restraint, sweating can not take place, at least, in any serious and intense case. But in keeping the disease under such restraint for a short time, the natural hydrothermal excretion is spontaneously restored, just as it is under similar circumstances in Cholera. The truth is that neither Cholera nor Diarrhœa are kept-up, and much less occasioned (contrary to what so many suppose) by a suppression of the hydrothermal excretion; but on the other hand, the suppression of that excretion is wholly caused by the exhausting effect of these two diseases, which prevents the natural production of heat within the system, and by the profuse

serous or aqueous discharge from the intestines, which always exists while these two diseases are active. When ever an aqueous discharge is morbidly and very greatly increased from one excretory, or takes place where there should be no discharge at all, it is always proportionally diminished from the rest. Some times such morbid discharge is so great as to draw-off the liquid in which the vitalized crassamentum of the blood is suspended, and which is necessary to its proper circulation. To attempt to cure Cholera and Diarrhœa by sweating is to attempt to remove primary and more intense pathological conditions, by the obviation of secondary, regular and less intense ones, conditions which will always disappear spontaneously, if those by which they are caused and kept-up are obviated. This is much like attempting to overcome a powerful army by shooting down a few of its camp-followers. The process of sweating, however successful it may be in the very incipient stage of these diseases while diseased action and condition are weak and by no means established, especially when it is pushed so as to make a strong and powerful impression, is certainly a bad process for cases in general.

After the incipient stage of Typhus of all species, Rheumatismus acutus, Enteritis Typhodes-Dysenterica, Catarrhus communis v. Endemicus, Pneumonitis Typhodes of all species, etc. has passed-by, I can not say that I ever knew the process of sweating employed without more or less injury; nor is the process sufficiently successful even in the very forming stage of these diseases to justify the hazard of its employment. I here allude to such methods as the warm-bath, the application to the body in bed of bags of heated sand, heated billets of wood, bottles of hot water, passing the steam of boiling water under the bed-clothes, a cavity being made for its reception by passing a stick from the head-board of the bedstead to the foot by the side of the patient, or even drenching the patient with hot watery liquids while under an unusual amount of bed-clothes.

It was the opinion of the late Professor Hubbard of Yale College, that the process of sweating is almost always a bad process in acute Febrile diseases; and that we may justly say of it, in the words of an author often quoted, "*nocet per se, juvat per casum.*" I think it may be very well compared to the process of drenching a patient with hot spirit and water in an incipient

Cauma, or to that of bleeding a patient half to death at the outset of a case of Typhus.

I have mentioned the principal diseases in which I have known the process of sweating employed with any expectation of important effects ; and I must say that when I have had opportunity to observe its operation, I have almost invariably been disappointed as respects its expected benefits ; and I must add that in a majority of cases, in which I have seen its use, I have considered the patient as most decidedly in a worse condition than before the process.

As remedial agents, the simple and pure Diaphoretics on the whole appear to me to be a comparatively unimportant class. I think they are never the principal remedies for any disease ; and that alone they never cure any disease ; so that at the most they can be reckoned only as auxiliaries. It is true that they are sometimes employed for the purpose of producing a direct resolution in the forming stage, and while the morbid action is weak, of certain acute non-phlogistic, and not materially atonic diseases ; and some times, though under my observation, very rarely, their use for this purpose is crowned with success. When a direct resolution of an acute Febrile disease is accomplished at its outset, by the production of Diaphoresis, it is effected by the strong impression made upon the system generally, and not in any degree by the evacuation, as was formerly believed even by the intelligent and the judicious. But when they fail of accomplishing this purpose (as undoubtedly they most generally do) it is my present conviction that the Diaphoretic or Hidrotic processes employed leave the patient in a worse condition than he was before such measure or measures were entered upon. This deterioration of the case, where the process fails of accomplishing the desired purpose, is partly due to the circumstance that the measure adopted must of necessity be more or less drastic, in order to furnish any chance of success ; and partly to a prevalent injudicious choice of agents for accomplishing the purpose. The former is not remediable, while the latter is perfectly so. When they are of greater or less service, I have long been satisfied that they never benefit by the evacuation which they produce, as was at one period of time the opinion of many.

Mere Diaphoresis produced by articles possessing nothing but

a Diaphoretic power, is no more Antiphlogistic than it is Antiseptic. Many practitioners of medicine appear to consider the Diaphoretics as among the most important remedies for nearly all of the species of Typhus and of the Phlogotica Typhoidea. It would probably be deemed incredible if I were to state the extent to which I have seen this practice pushed by particular individuals. It will be sufficient however to say in this place, that neither my own trials of this method, nor my observations upon it, under the direction of others, have produced any very favorable impression of its utility. It is indeed always desirable that the skin should be soft rather than husky, and slightly moist rather than dry; but this appears to me to be sufficient. Free, and much more profuse sweating has always seemed to me to be undesirable—in fact injurious; and of late years I have sedulously avoided it in the cases under consideration, and, as I think, with decided advantage. These remarks relate to the employment of Diaphoretics in the course and progress of these diseases, and not at all to their use in the forming stage and when diseased action is weak and not perfectly established.

It seems to be commonly supposed that Ephidrosis profusa or simple excretion of a preternatural quantity of Water from the skin is a peculiarly exhausting disease, and that the general debility which always accompanies this affection, is occasioned by the preternatural excretion of Water. I have long been satisfied, as a result of observation and experience, that these views are founded in error. I consider it as absolutely certain that the general debility in this disease, always precedes the morbidly profuse excretion, and is undoubtedly its principal or even essential cause. If the disease were nothing but a preternatural excretion of Water, the supposed waste might easily be supplied by drinking, since Water requires no digestion, passes speedily into the mass of the circulating fluids unchanged, is never assimilated to the living solids, and is excreted either as vapor, or as Water. To crown this absurdity with another equally great, Sulphuric and other Acids are recommended and commonly employed as the remedies—articles which are very certainly exhausting agents. Almost if not quite all of the books of materia medica tell us expressly that these Acids are Refrigerants and that Refrigerantia is but an other name for Antiphlogistica. In the modern English books

on *materia medica* the term *Antiphlogistica* is not employed as the name of a class of remedies, but the term *Refrigerantia* is used in its stead. It is true, they tell us that these Acids are Tonic, as well as Antiphlogistic. Now, how an agent can be at one and the same time both exhausting and invigorating, I can not well understand. Finding this contradiction in the books, I was obliged to investigate for myself; and the result of my observations and experience is that these Acids are decidedly exhausting and not at all invigorating, either in the way of the Tonics or the Antisbestics.

We find the following paragraph in a periodical for 1831. "Dr. Tribolet of Berne has found that the best mode of effecting this object" (i. e. the production of sweating) "is to put the patient into an empty bathing-tub, in which a Spirit-of-Wine lamp is made to burn." "The tub is covered with a carpet so as to concentrate the vapor which arises from the combustion." "In a few minutes, all the air beneath the carpet acquires a high temperature, and produces an abundant sweating of the patient." "This method has been repeated at Geneva with results exactly similar to those of the Bernese physician." (*Bibl. Univ. Octob. 1831. Quoted by Amer. Journ. Sci. and Arts, July 1832, No. I, Vol. XXII, Pg. 366.*) The employment of this method may be traced in Connecticut, between fifty and seventy-five years anterior to 1831, only instead of using a bathing tub covered by a carpet, a cavity was made under the bed-clothes, by passing a long rod by the side of the patient from the head-board of the bedstead to its foot and so tucking the covering as to prevent the escape of the heated air, and (as would seem) a considerable quantity of heated vapor of Alcohol. A tube with a trumpet-shaped mouth and small semi-circular pieces cut-out of its edge to admit air, covers the Alcohol lamp and leads by the foot of the bed into the cavity by the side of the patient. This tube was small, and made in several pieces that could be easily separated and again joined, for convenience of transportation or carriage. It was not large enough to be troublesome in a coat-pocket. But this mode of producing Diaphoresis was found to answer only in one set of cases, in which it was ever tried in Connecticut, viz. immediately on the attack of certain abnormal malignant Pyrectica and Phlogotica, in which the patient was very cold, nearly pulseless, at

least subcomatose, and extremely insusceptible—cases in which there was sudden and great exhaustion, without any inanition. With this measure was always conjoined the internal use of hot Alcoholic mixtures, hot Infusion of Capsicum, or other articles of the same general character. In ordinary non-malignant cases of diseases nosologically the same, or even of malignant ones not attended by such coldness, such failure of the pulse, such tendency to Coma and such insusceptibility, this measure often proved uncomfortable to the patient, some times occasioned uneasiness, restlessness or even jactitation, and decidedly left the patient worse than before its employment. As appears to me, it is by no means entitled to be recommended as a general Diaphoretic process.

The synonymy of this class is much smaller than that of many of the classes of which I have already treated. The term *Diaphoretica* which I continue to employ, not exactly from its appropriateness, is (as I have already said) generic, i. e. applicable to every grade of the operation of the class, not only by etymological signification, but by long established usage. The term *Hidrotagoga*, not only from its etymological import, but by ancient usage, ought to be applied only to that grade of a Diaphoretic operation called sweating; but modern usage has made its signification generic and exactly equivalent to Diaphoretic. If this term had been in popular use, such a change in its acceptance would not have been at all surprising, but confined to scholars, as its employment always has been, it is more singular that its application should have been thus changed. These two terms being legitimate Greek, both of them may with propriety be employed as names of this class, provided we consider that the latter has by custom fairly acquired a generic sense.

The terms *Perspirantia* and *Perspirativa*, *Transpirantia* and *Transpirativa* denote only that grade of this excretion which is called perspiration in contradistinction from sweating; though there is nothing in the etymological signification of these terms, that prohibits their generic use exactly in the acceptance of *Diaphoretica*. It is by custom only that they have been limited. In the U. S. A. or at least at the Northward, there is a popular extension of the English *Perspire* and *Perspiration* to their most comprehensive or generic sense. There seems to be a notion that

tory activity of the mucous follicles of the upper and smaller intestines, and of causing them to pour-forth a larger quantity of watery liquid, exactly like that which is effused from them in urgent Diarrhoea; and this without affecting any other mucous membrane; but, a Cathartic is, to all intents and purposes, a topical application to the intestinal canal; and as is well known, by means of topical applications, one mucous membrane may be even powerfully affected, without at all involving any affection of any other mucous membrane. I suppose that the immense secretions of air which are some times poured into the alvine canal (probably into the smaller intestines exclusively) are always from the mucous follicles.

So far as I know Blennagogues have never been searched-for in such a manner as to afford any reasonable expectation of finding them; by which I intend that they have never been searched-for with a definite understanding of the true difference between a Blennagogue and an Adenagic. Several years ago, an American medical gentleman announced in one of our most widely circulated periodicals, that he had ascertained that a particular indigestion article had the power of increasing the secretion from the mucous follicles of all the mucous membranes. Although he did not employ either the term Blennagogue, Myxagogue or Phlegmagogue, or any other term equivalent to these, yet he undoubtedly supposed that he had found what these terms truly imply, and would therefore have his readers understand him accordingly; and yet I was well acquainted with his article, and knew it to be an active Adenagic, and that it affected the mucous membranes only as a part of an Adenagic operation. It may perhaps be an argument in favor of the ultimate discovery of true and proper Blennagogues, in contradistinction from Adenagics, that all the mucous follicles of all the mucous membranes perform exactly the same functions, and doubtless therefore are endowed with the same peculiar susceptibility. If such is the fact, no medicine taken into the stomach can ever be expected to operate upon the mucous follicles of one individual mucous membrane, to the exclusion of the mucous follicles of every other mucous membrane. To this there may be one exception, viz. the mucous membrane of the alimentary canal. In that case medicines taken into the stomach may be considered as topical applications, in analogy

with the Errhines and the Esstomatics. A topical application can not be expected to affect all the mucous membranes in the same manner as it affects that to which the topical application is made. If this is correct, it would seem as if there might be Blennagogues but could not possibly be Chremptics or Expectorants. The additional consideration that there may easily be a factitious increase of the secretion from the mucous follicles of any individual mucous membrane, by certain topical applications to it, I think shows that Blennagogy is by no means impossible.

I esteem it quite certain that, among the articles acting in the peculiar manner that I call Adenagic upon the secretions and absorbents or the glandular system, there are some agents acting more in proportion upon the mucous follicles; and when this is the fact, it is commonly found that there are articles operating immediately and exclusively upon the single excretory or set of excretories most affected by such Adenagics. But though the mucous membranes in the aggregate doubtless have the same organization and susceptibility, and constitute a secreting apparatus, and may therefore be plausibly supposed to be capable of being acted-upon by certain peculiar articles, which may be capable of having their influence "determined" (as the prevalent language is) to these peculiar textures; all which may by some be considered as a good analogical reason for the expectation that true and proper Blennagogues will yet be discovered; and although the justice of this expectation may be considered as in some measure confirmed by the fact that there are a few Adenagics that decidedly increase the secretion of mucus from all the mucous membranes, at least in a slight and trifling degree; and yet, if we look to final causes, we should not expect to find Blennagogues, since if they exist they can scarcely, if at all, be reckoned as belonging to the *materia medica*, because they can produce no medicinal effects. The use of the secretion of mucus (as I have already inculcated) is only to lubricate the mucous membranes themselves, for which purpose only a very small quantity is necessary. But this secretion is never known to be suspended except transiently and on the immediate accession of certain Phlogoses of one of these membranes. As soon as a resolution of such Phlogosis is produced or takes place spontaneously, the secretion of mucus is immediately restored, and commonly even in an excess.

sive degree. Till this resolution takes place, the secretion can not possibly be restored; so that mere and pure Blennagogues, even if we possessed them, could render no service; and therefore this fact may be said to afford a presumption that there are none. Few—very few—if any useless things are to be found in connexion with the animal economy, though I will not pretend to deny that we have not yet learned the use of every thing in physiology and therapeutics.

I adopt this class as a substitute for the universally received class Expectorantia, for which I trust I shall be able to show that there is no good foundation. Whether there is any better foundation for this class will soon be considered; but even if there is not, it seems necessary to consider the subject at least as a peg to hang some important considerations upon, in regard to the mucous secretions.

This possible if not probable class is new, and so are its names, which, however as I trust, are legitimately formed from ancient and classical Greek terms. The limitations and restrictions of the definition are exactly such as distinguish true and proper Diuretics or Uragogues, and true and proper Diaphoretics or Hidrotagogues, from true and proper Adenagics, affecting these excretories only as a part of an operation upon the whole secernent and absorbent or glandular system. I need not pause here to enforce that there must be a material difference between Blennagogues and Chremptics or Expectorants, since if either should be discovered, the difference between them will be sufficiently obvious by a consideration of their respective definitions. But should it ever be established that such a class of agents as Blennagogues positively exists, I do not know that the indications for their use, so far as there are any, would differ materially from the indications for the use of true and proper Chremptics or Expectorants, in diseases of the lungs. Blennagogues might act more readily upon diseased than upon healthy mucous membranes, so that in Phlogoses of the bronchial membrane, the secretory activity of the follicles of this membrane might be increased, when there was no material increase of the secretory activity of the follicles of any other mucous membrane, so that, on superficial attention, a real and true Blennagogue might seem to be a Chremptic or Expectorant. Notwithstanding this, the truth is always valuable, so that

if there are no true and proper Chremptics or Expectorants, it is desirable to ascertain whether there are any true and proper Blennagogues; and if neither exist, it will be best to consider the articles commonly used for the promotion of Chremptis or Expectoration, as what they are exactly, viz. Adenagics, and to say nothing more about either Chremptics or Expectorants or even Blennagogues. After all, I do not feel by any means confident that either true and proper Blennagogues, or true and proper Chremptics or Expectorants (were we acquainted with such articles) would be at all capable of accomplishing what we ordinarily accomplish with the Adenagics commonly employed under the denomination of Expectorants.

As the class of agents which I am now considering has reference to the secretion of mucus not only from the bronchial but from all the other mucous membranes commonly so called, it is necessary to inquire after and ascertain the proper offices of this mucous secretion. The bronchial membrane differs from all other mucous membranes (as I have already pointed-out) in being the organ for the most important excretion of the whole animal economy, the effete Carbonum of the system, and also for assisting the skin in the excretion of the effete heat of the system. Beside this the lungs perform the function of bellows to the larynx. For these three purposes, it is necessary that air should be regularly inhaled into the lungs and exhaled from them. This in its turn requires that the bronchial membrane should be constantly moistened to keep it soft and flexible and also lubricated to prevent it from being irritated. The former of these is accomplished by the vapor of water, in which shape the effete heat is carried-off; while the latter is performed by the small quantity of mucus which this, as well as every other mucous membrane, secretes, and for the very same purpose. This (so far as I know) is the sole object of the mucus excreted from every and all of these membranes. In health, the quantity secreted is always very small. So far as I know the sole use of mucus is to lubricate, to keep soft and flexible, and to prevent irritation of the membranes which secrete it. As the bronchial membrane however, constantly excretes a large amount of vapor of water, its mucus is rather less important for keeping it soft and flexible than for other mucous membranes, but still it seems to be important for lubrication, and for the prevention of irritation.

It may perhaps be inquired here, how the very small quantity of mucus secreted by the bronchial membrane in health is finally disposed-of. As respects all other mucous membranes, the answer to such a question is sufficiently obvious. Perhaps I shall not be able to answer this question satisfactorily; but it appears to me to be gradually raised-up into the fauces, and subsequently either swallowed into the stomach, or rejected by hawking and spitting. When it is in the very smallest quantity, it is usually disposed-of unconsciously in the first way; but when it is more abundant, it is removed by hawking, as soon as it reaches the larynx. There seems to be some thing like, if not truly, a slight degree of upward peristaltic action in the trachea, and to all appearance, in the bronchial ramifications, doubtless dependent upon the influence of the pulmonary par vagum, an involuntary motor nerve of expression; since on slight lesion of the functions of this nerve, the mucus immediately ceases to rise, and the respiration becomes slightly rattling, as if the respired air passed through a small quantity of liquid. I believe it is absolutely certain that the upward peristaltic action of the stomach and œsophagus depends upon the gastric œsophageal branch of the par vagum, and therefore, if there is in reality any upward action of the bronchial and tracheal tubes, we should naturally expect to find it dependent upon the same nerve which is likewise sent to the stomach and œsophagus for the performance of the same function.

Under various irritations the mucous excretion of the bronchial membrane is liable to be greatly increased in quantity and diminished in consistence, when it becomes an exhausting drain to the system. In that group or genus of diseases called *Blennorrhœa*, a preternatural secretion of mucus seems to be the sole pathological condition. The several species of this nosological genus, are 1. *B. nasalis*, 2. *B. faucialis*, 3. *B. bronchialis*, 4. *B. intestinalis*, 5. *B. vaginalis*, 6. *B. vesicalis*, 7. *B. urethralis*. With each of the above species I am well acquainted. I do not think that there can be any other.

The first species is commonly called *Coryza* by the nosologists. It occurs both in an acute and a chronic form, the latter however being much the most common. When it is acute it is commonly mistaken for *Phlogosis*, and Good even calls it *entonic*, both of which are assuredly a very great error.

The second species is popularly called Catarrh, and this usage is imitated by those physicians who have never turned their attention to nosology. Every medical man however ought to know that Catarrh is the name of Influenza and Common Cold, popularly so called; and that the same name ought not to be applied to two such different diseases. If every popular blunder in subjects never studied by the great mass of the people, were to be imitated and adopted by scientific men, the whole circle of the sciences would soon be reduced to the confusion of Babel.

The third species is some times called Catarrhal Phthisis, and some times by a very great pathological error, Bronchitis, i. e. Phlogosis of the bronchial membrane. I have occasionally heard it called Leucorrhœa of the bronchial membrane, which conveys a correct notion of the nature and character of the disease. A chronic preternaturally increased excretion from the bronchial membrane may be an idiopathic affection, or it may be sequelar of several different and distinct maladies. There is undoubtedly an idiopathic Blennorrhœa bronchialis which seems to begin with weakness and a lax and spongy turgescence, of the mucous follicles, soon followed by increased secretory activity, which is augmented in some cases slowly, in others rapidly, till it becomes an exhausting discharge, and till it so disturbs the decarbonizing function of the lungs that, both in conjunction seem at last to destroy life. In all probability B. bronchialis occurs much oftener as a symptomatic affection, than as an idiopathic one; but, I think it beyond a question, that it is often an idiopathic disease. Whether it can by any possibility be produced by any medicinal agent or agents, will be inquired about in the sequel. Under certain irritations, the mucous excretion from the bronchial membrane has pus mingled with it, and this as would seem, some times to half the amount of all that is excreted, and without any ulceration of the membrane; but I do not know that this mixed excretion is any more exhausting than an equal amount of mucus of the same consistence.

The fourth species is generally accompanied with fecal discharges too soft to take and retain the shape of the intestines after they are voided, and also with preternaturally increased peristaltic action, and hence it is commonly called Mucous Diarrhœa.

The fifth species is commonly called Leucorrhœa or Whites.

This some times occurs in an acute form, when it is occasionally mistaken for Phlogosis. I have occasionally met with a mixture of pus with mucus in the excretion from the vaginal membrane, when the disease had not been what is called Clap. What had been the antecedents of these cases, I could not ascertain; but I suspect so much mechanical irritation as to produce a moderate amount of atonic Phlogosis of some sort or other, but certainly not attended with any contagion. A true and proper *B. vaginalis* some times remains after contagious Elytritis Pyoblennorrhœica; and it is not always easy to determine when the latter ends and the former remains; but this is of no great importance, since the same medicines will cure both.

The sixth species is commonly called Catarrh of the Bladder; but this appellation is wholly inappropriate since Catarrh implies a specific Phlogosis; and assuredly no Phlogosis exists in any stage of this disease.

The seventh species I imagine can not be very common as an idiopathic disease, even if it ever occurs as such. It is much the most common as a sequel of contagious Urethritis Pyoblennorrhœica; and there is the same difficulty in determining when the Urethritis ends and the Blennorrhœa merely, in fact begins, as in the case of contagious Elytritis; and here it is of more importance, since the same treatment is not equally appropriate for contagious Urethritis and for Blennorrhœa urethralis. I have seen a Blennorrhœa Urethralis as a sequel of a slight atonic Phlogosis of the urethra in consequence of sexual intercourse when there were vitiated vaginal secretions. That the Phlogosis was due to these, I infer from the fact that I have repeatedly seen a Peïtis Erythematica produced by vitiated vaginal secretions doubtless of a different character. If vitiated vaginal secretions of one sort may produce an Erythematic Phlogosis of the glans penis and the more delicate parts of the cutis vera, it becomes highly probable that vitiated vaginal secretions of an other sort may produce a Urethritis of a different specific character. The irritant effect of these vaginal secretions is commonly ascribed to acrimony; but I do not know of the least evidence that they possess the least acrimony. Their effects are much more probably due to some occult quality. Urethritis Pyoblennorrhœica is a Phlogotium essentially attended with a profuse mucipurulent excretion,

from the first formation of the Phlogosis in the urethral mucous membrane; but an increase of it is in no degree remedial, nor can it be diminished or arrested without first diminishing or arresting the Phlogosis.

I have here enumerated all the diseases within my knowledge, which seem to have their essential seat in the mucous follicles; but they all consist in morbidly increased secretory activity with no more vitiation than would seem to be necessary to their increase in quantity. From their nature and character Blennagogues can not possibly be remedial of any of them. I have no knowledge of any diseases in which there is a deficiency of the secretory activity of the mucous follicles. If there were any such, in them Blennagogues might be expected to render more or less service.

By some, much importance is attached to the color and other external sensible properties of the secretions from the mucous membranes under disease. These properties however do not vary to any material extent, as afforded by these membranes, except in the case of that of the intestinal canal, and that lining the bronchial tubes. All the varieties of vitiation of the secretion from the mucous follicles of all the mucous membranes that I now recollect ever having seen are the following, 1. A thick flocculent green liquid varying in shade from Verd-a-gris to bottle-green; as in some cases of *Diarrhœa chronica*. 2. A liquid resembling the lees of Cider and of the same dirty-yellow color; as in some cases of *Diarrhœa chronica*. 3. A brownish-white liquid like the yeast afforded by domestic Small-Beer made without Malt; as in some cases of *Diarrhœa chronica*. 4. A liquid resembling an intimate mixture of Sulphate of Calcia; as in those cases of *Diarrhœa chronica* called by John Mason Good, *Diarrhœa Gypsata*. 5. A liquid resembling what is called Rice-water; as in many cases of malignant epidemic Cholera. 6. A liquid much like the juice of Elder Berries, or like the darkest Port Wine; as in some cases of Dysentery. 7. A thick sub-liquid, like paste of Rye-meal; as in Dysentery and certain cases of *Pneumonitis Typhodes-notha*. 8. A liquid somewhat resembling soft soap much diluted; as in some cases of *Pneumonitis Typhodes-notha* and some of Dysentery. 9. A regular sanies of the color of brine in which Beef has been pickled; as in Dysentery and many cases of *Pneumonitis Ty-*

phodes-notha. 10. A substance resembling an intimate mixture of black snuff with mucus; as in some cases of *Pneumonitis Typhodes-notha*. 11. A liquid having considerable resemblance to Milk; as in the early stage of some cases of *Dysentery*; and in certain malignant forms of *Pneumonitis Typhodes-notha*, of which the constitutional febrile affection is a perfect *Typhus syncopalis*. This occurs with a Pink-colored tinge.

The secretion from the mucous follicles of the lining membrane of the intestinal canal seems to be subject to the greatest number of variations of vitiation; and next after this, the secretion from the mucous follicles of the bronchial membrane. I have no knowledge that the external sensible qualities, such as color, etc. of the secretions from the mucous membrane of the intestinal canal, or of any other organ, are ever of any pathological importance. I never could perceive that any of these varieties of secretion from the mucous follicles at all modified the indications of treatment for the cases in which they occur; and, as appears to me, at most they only assist in forming a judgment of the intensity and probable obstinacy of the case; and yet, they are not always capable of doing even this in all instances of their occurrence. During my whole professional life I have been in the constant habit of meeting with medical gentlemen, not only in private intercourse, but at the bed-sides of patients, who regulated their treatment of *Diarrhœa* by the color of the secretion from the mucous follicles. Till this secretion is of exactly the right color, they consider it as inadmissible to arrest the *Diarrhœa*. This secretion must always be "changed" before it can be in any way admissible to suspend the *Diarrhœa*. I have often inquired in what respect it is necessary that it should be changed? The answer has always been, in relation to color. Many physicians seem to desire to have it of a yellow color, before any diminution of it is deemed allowable; but there is no unanimity upon this point. I have met with gentlemen who did not consider yellow as the right color, but whenever it had attained to this, thought it necessary to administer Blue Pill (so called) or Calomel, till the secretion became green. Some, but as far as my observations extend not many, think white to be the true color, to which these secretions must be reduced, before there can be any safety in suspending *Diarrhœa*. I have often been kept occupied three-fourths

of the time of a consultation in inspecting intestinal discharges which had been reserved for my enlightenment, in anticipation of my visit; and I have some times been informed with wonder that the color had changed almost every day. I have often inquired what ill effects were to be expected if the Diarrhœa should be arrested, and kept under arrest till it would not return spontaneously, before these secretions should be properly "changed." The answer has usually been that it would produce Fever, which as seemed to be apprehended, would most likely be quite formidable; and there seemed to be in addition a vague apprehension that the system might be some how poisoned by the retention of so much morbid, and of course morbidic matter. The notion never seemed to have been thought-of that all this supposed bad and noxious matter had no existence before it was poured-out by the mucous follicles; and that if they were restrained from secreting it, it could have no subsequent existence. It is true that the mucous follicles furnish it only under disturbed function; but then, when they cease to furnish it, such disturbance of function must necessarily be obviated, at least for the time being. I have certainly known many a life sacrificed to this notion that a Diarrhœa must not be stopped till these secretions have been "changed," as the customary language is. When I have asked why it would not answer just as well to suspend or arrest these secretions, as to wait till they are "changed;" this question seems most commonly to be viewed as implying a rash and unsafe proposition, almost sufficient to make it proper to cashier the physician who has the temerity to harbor any such views, and much more to propose any thing so hazardous. The great error here, as appears to me, consists in viewing the vitiations of an unimportant secretion—vitiations produced by functional disease of the organ in which the secretion takes place; or produced by functional disease of the system at large—as primary and etiological conditions—as the essential part of the disease, and that upon which all the other pathological conditions depend. As far as my observations afford ground for judgment, all that seems to be of any importance toward correct treatment is the simple knowledge that there are much augmented and vitiated secretions from some particular mucous membrane; but the fact that these are yellow, green or white, or of any other color, I could never

turn to any certain account, either in diagnosis, etiology, prognosis or therapeutics. It is true, the more anomalous the color of the secretion, the more formidable we commonly think the disease, though I have known so many exceptions to this rule, that I repose very little confidence in the inference. The real truth is that, if a very abnormal appearance of these secretions is not accompanied by any other undesirable and bad symptoms, the character of these secretions is of no importance; but if any abnormal appearance of the secretions is accompanied with bad symptoms generally, it may be considered as heightening the bad character of the malady. If these views are correct it will follow as a matter of course that the variation in the quantity of this secretion, and especially the variation in its color, can not be of much pathological importance, not withstanding the different opinion entertained by so many physicians.

Are there any articles that have the power of increasing the secretion from the mucous membranes generally? I think there are articles that do this at least in a moderate, perhaps only in a slight degree; but so far as I know, none of them fall under the conditions of my definition of Blennagogues, since they all produce the effect in question as a part of an operation upon the whole secernent and absorbent or glandular system; so that instead of being Blennagogues they are in fact Adenagics. I do not think there are any medicinal agents that act directly, immediately and exclusively upon the bronchial mucous membrane, to increase either the secretory activity of its mucous follicles, or the secretory activity of those excretories which separate the effete Carbonum of the system from the blood, and present it in a nascent state to atmospheric Oxygen, in which state it is capable of entering into combination in such proportion as to constitute Carbonic Acid. But though I do not think there are any agents known that act directly, immediately and exclusively upon the bronchial mucous membrane to increase the secretory activity of its mucous follicles, etc. yet I am strongly inclined to believe that there are certain Adenagics that act more in proportion upon the mucous membranes in the aggregate, than upon the rest of the secernent and absorbent or glandular system, thereby increasing the secretory activity of the mucous follicles more in proportion than the secretory activity of the rest of the secernent and absorbent or

glandular system. Under the use of certain Adenagics I think I have known an increased secretion from most of the mucous membranes, when they were all in a state of health. This is nothing more than might reasonably be expected. Assuredly the mucous membranes have sufficient peculiarities of structure to be entitled to peculiarities of susceptibility; and if they have both peculiarities of structure, and peculiarities of susceptibility, we should naturally expect that peculiar Adenagics would act more in proportion upon them, than upon other parts of the secernent and absorbent or glandular system; and this would lead us to expect that there might be agents capable of acting directly, immediately and exclusively upon the mucous membranes in the aggregate, without affecting any other subordinate part of the secernent and absorbent or glandular system, and merely augmenting the secretory activity of the mucous follicles. As the secretion from the mucous follicles of the mucous membranes in the aggregate, is regulated by its own peculiar laws, so must any increase of it by medicinal agents, be more or less modified by these laws; and therefore, we ought not to expect that Blennagogues (if any such agents are ever discovered) will operate in all respects exactly like Uragogues or Diuretics, Hidrotagogues or Diaphoretics, or like Emmenagogues.

All or nearly all the works on *materia medica* common in our country that have any formal classification, have a class called Expectorantia or Expectorants; and even those which have no formal classification recognize a class bearing this name, by the fact that they habitually ascribe an Expectorant power to quite a large number of articles. But what is the etymological signification or import of the term Expectorantia or Expectorants? This term is evidently compounded of the Latin preposition *ex* signifying *from*, and the Latin noun-substantive *pectus* signifying *breast* generally, but here doubtless meaning the *thorax*. The term Expectorantia then imports etymologically *from the breast or thorax*, it being in fact equivalent to *expectore, from the breast or thorax* i. e. the *lungs*, this organ being the largest viscus within the *thorax*. Derived from this same preposition and noun-substantive we have also the term Expectoratio or Expectoration. But the term Expectorantia is Latin, and can not, according to strict rule, be retained as the name of a class. Never the less,

we find it in constant use. It may perhaps be asked whether there is any Greek equivalent or not? There is an ancient Greek verb compounded of the Greek preposition signifying *from*, and the Greek noun-substantive signifying *breast* or *thorax*, with the termination from which the English *ize* is made. Etymologically this verb would signify *Expectoro* or *Expectorate*; but the explanation of it that is given in the Lexica is *to repeat from memory*; etc. I do not know, and I have not now leisure to investigate whether this term was ever used in its etymological sense of *Expectorate* or not. A priori, I should think it altogether the most likely that it was; but I have no actual knowledge on the subject. *Apostethistica* would be a regular derivative from this verb and would signify *Expectorantia* or *Expectorants*. We find also an ancient Greek verb signifying *screo* i. e. *to reject from the lungs by hawking or coughing*, in one word, *to Expectorate*; and we also find an ancient Greek noun-substantive derived from this verb, which signifies *screatio* i. e. *some thing rejected from the lungs by hawking or coughing*; and also the act of rejecting from the lungs by hawking or coughing, in one word, *Expectoration*.

The term *Chremptica* or *Chremptios*, i. e. *Expectorantia* would be such an obvious and legitimate derivative from the verb above mentioned, that I can not but think it must have been employed by the ancient Greek physicians, since they employed the verb, and the noun-substantive which I am about to mention, though the term *Chremptica* is not contained in the only Greek Lexicon now before me. I have not leisure to search Hippocrates just now for the term *Chremtica*, or whatever he employed in its stead. But we find *Chrempsis* i. e. *screatio* or *Expectoration*. I believe, applied to the act of Expectoring, and also to the matter expectorated; and we also find *Chrempton*, *screabile* i. e. *capable of being Expectored*, and *Chremma*, *screatus*, *sputum*. Why such uncanonical terms as *Expectorant*, *Expectorantia* and *Expectoration* have been used exclusively in modern times, I imagine it would be difficult to explain satisfactorily.

But what do writers upon materia medica intend by the term *Expectorantia* or *Expectorants*? For the purpose of ascertaining this point I shall quote a number of definitions from what are considered as the best authorities. Richard Pearson says that

"Expectorants or Anacathartics are substances which are prescribed to promote the ejection of mucons or purulent matter from the lungs." (*Rich. Pears. Pract. Synops. Mat. Alimentar. and Mat. Med. Lond.* 1808, *Pg.* 148.) John Murray says that "Expectorants have been defined those medicines which facilitate or promote the ejection of mucus, or other fluids from the lungs and trachea." (*John Murray, Syst. Mat. Med. and Pharm. J. B. Beck's Edit. fr. 4th and last Edinb. Edit. N. Y.* 1828, *Pg.* 231.) Cullen says that "Expectorantia" are "medicines suited to promote the excretion or rejection of mucus or pus from the lungs." He adds, "what extent may be given to the meaning of this term, will be considered hereafter in its proper place." (*Cul. Mat. Med. Bart. Edit. Philad.* 1812, *Vol. I. Pg.* 118.) Dr. Nathaniel Chapman says that "Expectorants are usually defined to be those medicines which promote the bronchial secretion and facilitate the process of its ejection." (*N. Chapm. Elem. Therap. and Mat. Med. 6th Edit. Vol. I, Pg.* 346, *Phil.* 1831.) John Eberle says that "Expectorants are medicines which promote the bronchial secretion, and facilitate their discharge by expectoration." (*J. Eberle's Mat. Med. and Therap. 2d Edit. Vol. II. Phil.* 1825, *Pg.* 355.) Hooper says that Expectorants are "those medicines which increase the discharge of mucus from the lungs." (*Rob. Hoop. Lex. Med. Akerly's 4th Amer. Edit. N. Y.* 1829, *sub voce.*) J. Moore Neligan says that "Expectorants or Pectorals may be defined medicines which promote the secretion from the bronchial tubes and air-passages, and facilitate its discharge." (*J. M. Neligan, Med. Uses and Mode of Administr. etc. 2d Edit. Dubl.* 1847, *Pg.* 203.) F. W. Headland says that "Expectorant, when taken in its widest sense, is applied to all medicines that cause the evacuation of mucus from the secreting surface of the respiratory tubes and cavities." "They help the natural process of Expectoration." (*Fred. Wm. Headland Ess. on Act. Med. in Syst. 2d Edit. Lond.* 1855, *Pg.* 306.)

According to the common notion of a Chremptic or Expectorant, it must not only increase the secretory activity of the mucous follicles of the bronchial membrane, but it must also increase the activity of the purulent excretories of a pulmonary Ulcer. These, I believe, comprehend all the variations of authors in the defini-

tion of the term Expectorant, at least as found in the most common works on the *materia medica*. It must be noticed that one set of authors limits the application of this term to articles which are supposed to be capable of occasioning, promoting or facilitating merely the rejection of mucus or pus, and if I understand the matter aright, any other liquid, from the lungs. An other set of authors extends the application of this term to articles which are supposed not only to occasion, promote or facilitate the rejection of mucus, pus or other liquids, but also to occasion or increase the secretion or excretion of these substances from the lungs. A third set limits its application to such articles only as are supposed to increase the secretion of mucus from the bronchial membrane.

How is the rejection of mucus or pus from the lungs accomplished? John Murray says that as Expectoration as ordinarily defined is "a complicated and partly voluntary operation, dependent on the action of a variety of muscles, it is difficult to perceive how these remedies" (i. e. those commonly reckoned as Expectorants) "can produce any such effect." (*J. Murr. Syst. Mat. Med. and Pharm. see J. B. Beck's Edit. fr. 4th Edinb. Edit. N. York, 1828, Pg. 231.*) There are certainly no medicines which will accomplish the rejection, however they may affect the secretion of mucus from the bronchial membrane. With the exception of the natural very small quantity of health, I know of no means of rejecting it, except by the act of coughing and to a sparing amount, by what is called hawking. There are no medicines within my knowledge that will produce a cough. But would it be desirable, if it were practicable, to kindle into activity a factitious cough for the sake of producing Expectoration. According to Pearson's and John Murray's definition of Expectorantia, there would seem to be no such agents in the *materia medica*, and in all probability there never will be. If there are no medicines capable of directly affecting a rejection of mucus or pus from the lungs, without producing an increased secretion of these substances, we have no reason to believe that there are any which will accomplish both these purposes at once. But whatever may be our conclusions *a priori*, as a matter of fact, no such articles are actually known.

Are there any articles that have the power of increasing the secretion of mucus from the bronchial membrane? At once I

answer yes, in a moderate or slight degree; though not from the bronchial membrane alone, but at the same time from all the other mucous membranes. They can not therefore be reckoned as Expectorants, Apostethistics or Chremptics truly and properly, since their operation is too extensive. But these articles while they are increasing the secretion of mucus from all the mucous membranes, increase also the secretions from all, or nearly all the continuously acting secretories and excretories. They are therefore not even Blennagogues, Myxagogues or Phlegmagogues, but they are most certainly Adenagics, the operation of which we are treating being merely the Blennagogue part of their Adenagy. There are then Adenagics that act decidedly, though moderately upon the mucous membranes, directly increasing their secretory activity; and it is always some of these that are most commonly reckoned the best Expectorants, Apostethistics or Chremptics. Generally there are articles that operate directly and exclusively upon all those excretories which are affected decidedly by any of the Adenagics. But in the present state of our knowledge upon this subject, we can not be certainly said to possess any true and proper Blennagogues any more than any true and proper Emmenagogues, as I shall have occasion to show. From analogy merely, I should expect to discover both, when they are properly sought-after, with definite notions as to what constitutes true and proper articles of these classes; but never the less, for reasons elsewhere given, I do not now expect it. The *cui bono* of the discovery of the former will be considered in a more appropriate place. Hitherto physicians seem to have been content with Adenagics as substitutes for Blennagogues.

Upon the whole then, it appears to me that there can be no good ground for the expectation that we shall ever discover any agent or agents that will act directly and exclusively upon the mucous follicles of the bronchial membrane (not affecting the mucous follicles of any other membrane) increasing their secretory activity; and yet this must be necessary to the discovery of Chremptics or Expectorants. In short, I do not believe there is any good foundation for any such class of medicinal agents as Chremtica or Expectorantia, i. e. Chremptics or Expectorants. But, under certain circumstances, there is some times a profuse

and preternatural excretion of greatly changed, and greatly vitiated liquid matter from the mucous follicles of the bronchial membrane, when no other mucous membrane is involved. This however is always the effect of disease and not the effect of medicine.

But as to the actual existence of true, proper and mere Expectorants, what say those authors who discuss this point? John Murray says that "there are only two classes of medicines which seem capable of promoting Expectoration in this manner" (viz. that which he specifies) "powerful Stimulants, which when extreme debility is present, may promote it, by giving vigor to the voluntary muscles exerted in the operation; and Emetics, which, by exciting vomiting, compress the thoracic viscera, and by calling all the neighboring muscles into strong action, and rendering both expiration and inspiration more forcible, may facilitate the expulsion of matter from the cavity of the lungs." "But these" (classes of medicines, viz. Stimulants and Emetics) "exert no specific action, and therefore are not entitled to the appellation of Expectorants; nor indeed are they usually considered as such." (*J. Murr. Syst. Mat. Med. and Pharm. J. B. Beck's Edit. fr. 4th Edinb. Edit. N. York, 1828, Pg. 231-2.*) If no articles prove Expectorant except by operating as powerful Stimulants, and thereby obviating extremely impaired tone of the muscles concerned in coughing and hawking; or by occasioning vomiting; we may well say that we have no Expectorants; for I hold it to be a fundamental principle that two or more classes can not be founded upon one and the same power; and that one class can not be founded upon two different and distinct powers, which are already the foundation of other classes; both of which are here done by Murray to make out a class of Expectorants. But John Murray himself says—"If therefore, by Expectorants, are understood substances capable of promoting, by some specific action on the parts concerned, the expulsion of fluid from the lungs, there appears no reason to believe in the existence of such remedies." (*Ibidem, Pg. 232.*)

Dr. Richard Pearson in fact recognizes John Murray's views in regard to Expectorants, when he says that "many of the Expectorants, which are of a Stimulant nature, are inadmissible while active Inflammation subsists" (*Rich. Pears. Pract. Synops. Mat. Alimentar. and Mat. Med. Lond. 1808, Pg. 148*) and when

he says that "most of the Expectorants, on account of their nauseating and purgative tendency, require small doses of Opium to be joined with them. (*Ibidem.*)

Though there is a general agreement as respects the definitions of this supposed class, among authors and practitioners of medicine, yet it is not a little singular that there is almost a universal disagreement in every other respect. On this account I shall quote the views of a late very distinguished author and practitioner, whose professional works have been the text-book of many of our instructors in the principles and practice of medicine; and also those of a writer on the *materia medica*, whose work "On the Action of Medicines on the System" has lately obtained from "The Medical Society of London," "The Fothergillian Gold Medal for 1852," "Second Edition revised" etc. In England, this must of course, be considered as the ablest work on this part of the *materia medica* now extant in the language. Perhaps my readers will be disappointed that I have not previously enriched my pages with extracts from this work; but to tell the truth, it has, in some unaccountable manner, heretofore escaped my especial attention—no valid excuse, as I am ready to confess.

Good says that "the principles upon which Expectorants act, is in some degree doubtful." "The simplest way of accounting for it" (i. e. their action) "is by means of a specific determination to the lungs." He adds, "as we have pretty clear proofs of medicines operating specifically upon other organs, as that of Mercury upon the salivary glands, and Cinchona upon the irritable fiber, there is no reason why we should not expect a like operation upon the viscera of the chest." "Dr. Cullen is quite at a loss upon this subject, from not admitting specific medicines, or a specific action upon any organ." "As a general rule, Cullen supposes Expectorants to operate on the bronchi merely, by a Diaphoretic power, or that of increasing the flow from the superficial exhalants at large, and consequently the exhalants of the lungs, by which the mucus present in the follicles may be poured-out in a less viscid form, and hence in a state to be more easily thrown-up by the trachea." (*Good Stud. Med. 4th Amer. Edit. Boston, 1824, Vol. I, Pg. 541-2.*) It would have been well if Good had first inquired whether there are any Expectorants, before he attempted to ascertain their *modus operandi*. But Good would

not probably have troubled himself in regard to the difference between articles operating directly and exclusively to increase the secretory activity of the mucous follicles of the bronchial membrane; articles operating directly and exclusively to increase the secretory activity of the mucous follicles of all the mucous membranes; and articles operating to increase the activity of the whole secernent and absorbent or glandular system, and affecting the secretory activity of the mucous follicles of the bronchial membrane, or of the whole mucous membranes, only as a part of their general operation upon the secernent and absorbent or glandular system. By the context or what Good says in immediate connexion, I judge that by "a specific determination to the lungs," he must mean only an obvious operation to increase the secretion from the mucous follicles of the bronchial membrane, without reference to any other operation exerted upon any other part of the system at large. But if this is his meaning, how could he possibly admit the existence of Expectorants at all, without admitting at once this mode of operation. In this sense of "a specific determination" to any part or organ; I can not well discover how such "a specific determination" can ever be doubted or denied. Who can question that Cathartics have just such "a specific determination" to the intestinal canal, so long as they increase secretions into it, and then augment the peristaltic action, thereby greatly changing the quality, and increasing the number of the alvine discharges. Who will deny the "specific determination" of Emetics, of Diuretics, of Diaphoretics, etc. to the parts upon which they respectively act. If any other excretions are capable of being augmented by medicines, in this manner, it appears to me that such augmentation can be produced only by such "a specific determination." As appears to me, it is sufficiently evident that when any medicine operates more especially upon any particular part or organ, either the medicine or its influence merely must have "a specific determination" to the part in which the manifestations of its operation appear. This must be true of every class of agents in the whole materia medica, as well as of the supposed Expectorants; and this statement appears to me to amount to very little, if any thing more than the identical proposition that if an agent operates upon a part, it operates upon a part. I can discover no good reason a priori why every distinct

subordinate part of the system should not be capable of being operated-upon in this manner; and it must be a matter of investigation and research to ascertain how many of these parts are actually so operated upon. I do not forget here that I have combated the doctrine of an especial determination to the skin in the case of the Diaphoretics; but that was in a different sense. I take speculations, or at most hypotheses as I find them, and if I deem them incorrect I controvert them accordingly. It is not necessary to controvert what no body maintains. I have been in the habit of hearing it maintained that a special determination of blood to the skin (not a special determination of the influence of the Diaphoretic medicine to the skin) is necessary for the production of Diaphoresis, and I have controverted the former, not the latter. The latter I hold as very nearly equivalent to maintaining that Diaphoretics are Diaphoretics. But, in what way these considerations throw any particular light either upon the *modus operandi* of the supposed Expectorants, or that of any other medicinal class, beyond the statement of a very general principle, I can not well discover.

For myself, I can not discover any more reason for being "at a loss," as the common phrase is, about the operation of the supposed Expectorants, than for being at a loss about the operation of every other legitimate class of medicinal agents. Certainly all those that operate upon any of the secretories must be in the same category. The manifestations of the operation of every genuine class are always more especially in some one or more of the subordinate parts of the system, and must necessarily be so. All that can be said of this is that in the very nature of things, some medicines act more especially upon one part, and some upon another. If this were not the fact, we should not possess agents adapted to the treatment and the cure of all the variety and diversity of diseases to which we are subject. Such an operation is, in one sense, and a legitimate one too, a specific operation. The truth is that not only Good, but Cullen and many other distinguished writers upon the *materia medica*, appear to me to be often puzzled and perplexed by their own loose thinking and loose phrases.

The term specific is used in the *materia medica* in a considerable variety of acceptations, so that in some of these, we may be

said to have specific medicines, while in others, this proposition may be wholly denied. In the sense we have just been considering, we may truly be said to have specific medicines. It is also quite certain that every individual medicine (except where two or more articles contain the same active principle or principles) may have and almost always does have peculiarities of power and operation, that justly entitles it to the denomination of specific, in one sense of this term. Again, some remedies are supposed to be capable of curing certain diseases intirely upon a principle peculiar to themselves, and of course different and distinct from that upon which any other medicine operates. If this were true, such medicines might be properly enough termed a specific, in one of its senses. I consider it as much more than doubtful whether any such case exists; and if one should actually be ascertained, in all probability it would only indicate the discovery of a new power in the materia medica. A specific in the sense of an article capable of absolutely curing all cases of a given disease, in all its shapes and forms, grades or degrees, I hold to be a mere chime-ra. I know that in former times, specifics in this sense were supposed to exist; but I doubt whether any physician of the present day, of ordinary intelligence, can entertain such a belief for a single moment. In the sense of affecting more especially, the Mercurials may be said to have "a specific determination" to the whole secernent and absorbent or glandular system; and in the sense of affecting still more especially, they may be said to have "a specific determination" to the salivary glands, in preference to the rest of the secernent and absorbent or glandular system generally. Cullen could never have intended to deny this, by his denial of specific remedies, since he must have known it too well. In his denial of specific remedies, he must therefore have had some other sense of the word specific in view. This is too obvious to require any examination or discussion. Exactly what is meant by Cinchona's operating specifically upon "the irritable fiber," is not quite so clear. Does "the irritable fiber" here mean the whole of the living soft solid, or merely the proper muscular fiber, or some thing else? I have long studied the effects of this agent, and I have always found the primary manifestations of its operation in the sanguiferous system, or more particularly in the heart and arteries. According to John Murray's peculiar phrase-

ology, this would argue "a specific determination" of the influence of this agent (not necessarily of the agent itself) to the circulating system. As appears to me, it affects other subordinate parts of the system secondarily, and in a certain degree remotely.

I notice and discuss these points only to show that though they may be true, yet they really explain nothing, and may be as correctly affirmed of every class of remedies as of the supposed Expectorants, and indeed of every individual remedy in the whole materia medica. To say of a given article that it has "a specific determination" to the kidneys is tantamount to saying that it is Diuretic; and of an other article that it has "a specific determination" to the skin, that it is Diaphoretic. Saying therefore that an article has "a specific determination" to the lungs, is (according to the customary language of authors of the present period) equivalent to saying that it is Expectorant, as I have heretofore declared.

As appears to me, it can not possibly be true that the supposed Expectorants are the mere Diaphoretics of the lungs; which seems to be Cullen's conclusion, since he says, "if there are medicines disposed to pass by perspiration, it may be presumed that the same are disposed to pass by the exhalation from the lungs," etc. (*Cull. Mat. Med. B. S. Bart. Ed. Phil.* 1812, *Vol. II*, *Pg.* 321.) It is my present belief that both the Anthracagogue and the Thermagogue excretories of the bronchial membrane are not only distinct from each other, but from the mucous follicles, which last, I doubt not, always furnish the matter which is Expectorated. I judge that this is the fact from the great diversity of these functions. I do not think that I could demonstrate this upon a dead subject, though a more experienced anatomist might do it. I mention this only to enforce my dissent from Cullen's supposed notion that the matter expectorated is furnished by the Diaphoretic excretories of the bronchial membrane.

Headland says that "many medicines are capable of acting indirectly as Expectorants." (*Fred. W. Head. Act. of Med.* 2d *Edit. Lond.* 1855, *Pg.* 306.) "Anything which causes a Cough, as an irritant gas will do it." (*Ibidem.*) "So will any thing which thins the mucus, when thick and viscid, e. g. inspiration of the vapor of hot water." (*Ibidem.*) No doubt that Cough promotes Expectoration; but who would ever create a Cough as a

medicinal process or to produce Expectoration even for the time being, and much less establish one for this purpose? And yet, absurd as this may seem, at first view, I have often known patients instructed to cough as much as they conveniently can, in order to get rid of mucus, which seems to be supposed to be stowed-away some where in the lungs. It seems to be the opinion that if this mucus should be retained within the system, it would prove noxious in some way or other. Such notions are by no means uncommon among physicians, and they are very nearly universal with persons not practical members of the medical profession. They have doubtless done immense mischief and they will doubtless continue to prevail with patients as long as they are entertained by physicians; and vice versa, they will be entertained by a greater or less number of physicians as long as they are prevalent among patients; so that they are not likely to be speedily forgot. I never could discover that the vapor of hot water either thinned thick and viscid mucus or promoted Expectoration in the least appreciable degree. There is always abundance of vapor of water in the lungs, viz. the natural hydrothermal excretion; and what little can be inhaled in addition, as appears to me, can be of no sort of consequence.

Headland says that "special sedatives which control the function of the Vagus nerve are particularly notable as indirect Expectorants." "Such are Antimony and Ipecacuanha." "By diminishing the morbid irritability of the pulmonary surface, they prevent the continued secretion of mucus." "By allaying a spasm of the small bronchial tubes, and controlling the nervous sensation of want of breath, they may promote the evacuation of that which is already secreted." (*Headl. Pg. 306.*) If I were to be called upon to name any "special Sedatives, which control the function of the Vagus nerve," as Headland says, I should mention Hydrogenii Cyanidum, Strychnos toxifera, Conium maculatum, Papaver somniferum, Oleum Empyreumaticum Nicotianæ, etc. All of these are powerful sedatives, and when pushed so as to destroy life, they accomplish this by suspending the functions of all the nerves of expression, and the par vagum of course with the rest, while the nerve of chymical action nutrition, etc. continues to perform its function for a considerable time longer. But I should not expect any of these to prove either indirectly or directly Ex

pectorant, unless it might be two of them which have other powers by which they may possibly operate in this manner, under certain circumstances. As appears to me Antimony is a "special sedative" only so far as it is Antiphlogistic, and is adapted only to phlogistic cases of disease, which are few in comparison with atonic cases. There are seven distinct species of Pneumonitis and only one of the whole number is ever phlogistic. This is probably about the proportion of the phlogistic to the atonic ones. The Antiphlogistics always relieve phlogistic diseases and Pneumonitis among the rest. If they are properly employed at the outset of a Phlogistic Pneumonitis they produce a direct resolution without any expectoration. If a resolution is not produced till about the seventh day a mucipurulent expectoration follows this late resolution. Now the expectoration is the effect of the resolution, and the resolution is the effect of the Antiphlogistication, and the Antiphlogistic may be Antimony. I have long been well satisfied that this is the only way in which Antimony ever conduces to expectoration, and this is indirect enough. It is true that if Antimony were to be pushed to vomiting, the act of vomiting would be Adenagic as long as it continued, and in the Adenagia the bronchial membrane would be affected as well as the rest of the secernent and absorbent or glandular system. But in phlogistic diseases, and especially Phlogotica, vomiting is strongly contraïndicated, and Adenagy will render no service, whether it is contraïndicated or not.

Cephaëlis Ipecacuanha (the numerous other articles called Ipecacuanha I say nothing of, in this place) appears to me to be a mere Nauseant and Emetic. At all events I never could obtain any other effects from it. How these powers entitle it to be called a "special sedative" I know not. If we possessed nothing better for the production of Expectoration, as appears to me, it would not be worth while to pretend to the possession of any articles of this class. If Antimony were to be pushed so as to destroy life, it would doubtless suspend the function of the nerve of chymical action nutrition, etc. before it would suspend the function of the nerves of expression; but it would not destroy life by doing this merely. I know of no sort of evidence that either of these agents exerts the least influence on the pulmonary par vagum, except a Nausiatic and an Emetic one, and much less, that they "control

its functions" in any other respect. What is here referred-to, I can not even conjecture.

I know of no evidence that Antimony ever "diminishes any morbid irritability of the pulmonary surface," except that of phlogistic Phlogosis, which, as an Antiphlogistic, it relieves of course. I do not believe that Cephaëlis Ipecacuanha produces any degree of the same effect. Again, I do not understand how by "preventing a continued secretion of mucus," these articles can prove indirectly Expectorant. I never yet met with any evidence that the "bronchial tubes" are ever affected by spasm, or that any such spasm ever prevents the production of Expectoration, or that either Antimony or Cephaëlis Ipecacuanha are appropriate remedies for Spasm. I am not apprised that any texture of the lungs is ever subject to Spasm, unless Cough is a Spastic affection. It is certainly very much like Clonic Spasm. I very well know that irritation of the pulmonary par vagum occasions Cough. The pulmonary par vagum is an involuntary motor nerve of expression, which is sent to the lungs proper. If it is divided before it reaches them, they collapse, never again to be inflated spontaneously. This fact together with the other in relation to Cough, that has just been mentioned, leads to the conclusion that the pulmonary par vagum is the proper involuntary motor nerve of the lungs, indeed (so far as I know) their only motor nerve; for I am not apprised that this organ receives a voluntary motor-nerve. If therefore the lungs are really subject to Spasm, it would seem as if it must be through this nerve.

Dyspnœa exacerbans is almost universally called Spasmodic Asthma, in the U. S. A. This implies an Asthma in which there is some thing like Spasm, but which is not truly such. But what is the peculiar pathological condition here intended by the term Spasmodic? If this disease is carefully and accurately observed, it will be found that respiration is not only more frequent than natural, but that every inspiration is deeper and fuller than in perfect health. Neither of these phenomena are like Spasm. But the patient still complains of want of air, and that what he inhales renders no service. At the same time the cutis vera is paler than natural, and the lips and other parts covered by the epithelium merely, are of a dark crimson color. I suppose that this must be that, which is considered as indicating Spasm of the bronchial

ramifications. If it does however, how does the air enter them, in the uncommonly full inspirations; for such are all the inspirations and that uniformly; and is the Spasm perfectly continuous and permanent? For myself I know nothing of a perfectly continuous and permanent Spasm. As appears to me, the pathological phenomena indicate an imperfect or incomplete Acinesia of the pulmonary branch of the nerve of chymical action, nutrition, etc. on which depends the excretion of the effete Carbonum of the system, rather than Spasm of the bronchial tubes. How these two agents "control the nervous sensation of want of breath," as well as "allay the Spasm of the bronchial tubes," and thereby promote the evacuation of mucus already secreted, is all a mystery to me.

Headland says that "Opium and Stramonium, classed among Narcotics, depress the function of the Vagus nerve, as well as the nervous forces generally." "So do other medicines similar to them." "Opium in small doses allays irritability and diminishes Spasm, and is then an indirect Expectorant; but in large doses it acts so powerfully as to render respiration difficult and Expectoration impossible." "Its use therefore demands great caution." (*Headl. Pg. 306.*) Papaver is undoubtedly one of that group of Narcotics that acts more especially upon the involuntary motor nerves of expression; but it is only when it is pushed beyond the ordinary grade of medicinal effect, that this becomes obvious. With its four or five different and distinct powers, it would be strange if it did not occasionally prove indirectly Expectorant. Whether in reference to the subordinate part of the nervous system which they more especially affect, the several species of *Datura* belong to the same group as Papaver, I know not. I never saw them taken to such an extent as to endanger life, or to affect one part of the nervous system more than another. I never saw any one of them prove Expectorant, nor with my knowledge of them, should I ever expect such an operation. The secretion of mucus from the bronchial membrane undoubtedly depends upon the nerve of chymical action, nutrition, etc. like all other secretions; and in order to affect this particular secretion, this nerve must be acted-upon. The rejection of the secretion is partly involuntary and partly voluntary. So far as it is involuntary, the pulmonary par vagum is more or less concerned. Exactly what

Headland means by large and small doses of Opium, I find it difficult to understand. I have never been in the habit of seeing it administered for medicinal purposes to such an extent as "to render respiration difficult;" but Mr. Headland may have a mode of managing it, that I am ignorant of.

We come next to Mr. Headland's "true Expectorants;" and the first articles mentioned are "Antimony and Ipecacuanha." I do not think that according to Mr. Headland's definition, or that of any other author, either of these two articles possesses the least degree of Expectorant power. Antimony is Antiphlogistic, Neuragic, Nausiatic, Emetic and Cathartic, and these are all its powers. It is not Adenagic, nor does it operate directly and exclusively to increase any single secretion or excretion. As an Antiphlogistic, it may contribute to abate phlogistic Phlogosis of the lungs, and thereby to produce a resolution of the disease, which if it takes place about the seventh day, is usually followed by a free mucipurulent secretion. But this does not constitute an indirect Expectorant operation, at least as appears to me. The supposed indirect Expectorant operation of these two articles Mr. Headland calls "Neurotic," and their supposed direct Expectorant operation he calls "Eliminative." He says that "we are as yet unable to decide whether or no" these two articles "are ever secreted by the mucous glands, because not only is the analysis of the mucus a matter of difficulty, but hitherto no investigation of the matter has been made." (*Headl. Pg. 306.*)

Headland says that Squill also is probably an eliminative Expectorant (*Pg. 306.*) Now *Urginea maritima* being a decided Adenagic does often directly increase the secretion from the bronchial membrane, but it produces this effect only as a part of a more general operation upon the whole secernent and absorbent or glandular system.

He says that "many of the true Expectorants are volatile and odorous in nature. (*Pg. 307.*) It does not appear to me that many of the articles which operate as Expectorants are volatile, or eminently odorous. I suspect that Mr. Headland's notions upon this subject originated from the view that articles whose odor is perceived in the breath, must be particularly determined to the lungs, and therefore must necessarily be Expectorant. He does not say this however, but as I have met with physicians who

entertained the same notions, and on this ground, and I can not but suspect that this is the ground on which Mr. Headland entertains them. He says that "the following are the chief volatile Expectorants, the odors of which have been clearly detected in the breath of persons to whom they have been administered," viz. Turpentine, Camphor, Alcohol, Æther and the volatile oils of Onions, Fennel, Assa-fœtida, Caraway, Cinnamon and Anise." (*Headl. Pg. 307.*) Turpentine, by which I understand the Oleïresin of resin-producing trees, occasions a peculiar odor in the breath, but it does not appear to me to be the odor of any thing contained in the Turpentine before it was swallowed, but rather the odor of some new compound formed in the system from the Turpentine. Whatever Expectorant effect this article produces, does not appear to depend upon this odorous principle; for I have often known the Expectorant effect produced when the odorous principle did not appear either in the halitus from the lungs, or in the urine. When the patient has long had rather a lax state of the intestines, it is rare, if ever, that this odor is perceived in the breath. Turpentine is Adenagic, and therefore it acts in a greater or less degree upon the bronchial membrane, but only as a part of its operation upon the whole secernent and absorbent or glandular system. Its operation is of course direct. I do not consider Camphor as ever proving Expectorant. Alcohol and Æther are never direct Expectorants, though they may occasionally act as indirect ones. Alcohol is Oresthetic, Euphrenic, Antisbestic, Diaphoretic, Diuretic and Narcotic. It would be strange if by one or the other of these powers, it might not occasionally prove indirectly Expectorant. Æther (common of course) is Oresthetic, Euphrenic, and directly exhausting, so much so that it would in all probability be Antiphlogistic, if its Oresthetic and Euphrenic powers were not contraïndicated in phlogistic diseases. But notwithstanding all these powers, I never knew it prove Expectorant either directly or indirectly. I do not know of any Volatile Oils that are Expectorant, unless it is Oil of Turpentine. This I consider as being Adenagic and of course acting upon the bronchial membrane as a part of the secernent and absorbent or glandular system. I am not acquainted with any Volatile Oil of Onions, but a Syrup of Onions I have often known used as a pectoral as the language was; by which was not intended an Expectorant, but what was

intended I am unable to say. I am quite sure that I never knew any preparation of Onions to prove Expectorant, whatever other physicians may have known. If the Onion is truly medicinal I am ignorant as to what its powers may be. I never witnessed any thing like Expectorant effects from the Essential Oils of Caraway, Fennel and Anise, though I have often had occasion to prescribe them; but this is mere negative testimony. Mr. Headland may be far better acquainted with them than I am. As to the Cinnamomhylid of Hydrogen (which is a very peculiar substance commonly called Essential Oil of Cinnamon, and which appears to be both a salifiable base and a salifying compound, since it will combine either with Nitric Acid, or with Ammid of Hydrogen, or perhaps Oxyd of Ammonium and form crystalline Salts) I do not know exactly what its powers are. It is certainly Oresthetic, and this is all I can say with confidence. I have suspected it of being Antisbestic, Erethistic and Euphrenic. It may possibly be Narcotic, but I never saw any such effect. It would not be surprising if in some cases it should prove to be indirectly Expectorant; but I never witnessed this effect from it. *Assa-fetida* always appeared to me to be a very feeble medicine. I think it certainly possesses more or less Euphrenic power, and more or less Adenagic power. In a case in which a patient took at once more than ninety very large pills of it (under Hysterical delirium) it produced one single full Cathartic operation. Previously the patient was neither costive nor lax, and nothing was taken along with it. If it is really Adenagic, it may be expected to affect the bronchial membrane as a part of the secernent and absorbent or glandular system.

Headland says that "all excreted substances have to pass by an endosmotic process through a thin animal membrane; and it is necessary, before they can pass, that there should be on the other side of this membrane, some thing which is capable of dissolving them." (*Headl. Pg. 307.*) He says that Expectorants, whether they pass through the mucous glands, or immediately through the thin wall of the lung-cell, are brought directly into contact with air; and in this air, these volatile matters are soluble, and carried away by it." (*Headl. Pg. 307.*) This I suspect, furnishes the key to the principle part of Mr. Headland's peculiar notions. Expectorants must pass through the mucous glands by

secretion, or through the bronchial membrane by endosmosis, in order to operate as Expectorants; and consequently, every thing that is perceived in the halitus from the lungs must have passed in one of these ways, and must therefore be an Expectorant. This as appears to me, is regularly part and parcel of the hypothesis that the medicine itself, and not merely its influence, must be "determined," as the customary language is, to the part or organ upon which it acts more especially.

As will readily be inferred from what I have said and what I have inculcated in the early part of this work, I dissent intirely from Mr. Headland's views. He does not seem to recognize the three distinct sets of excretories in the bronchial membrane, viz. those for the effete heat, those for the effete Carbonum, both of which are highly important emunctory excretions of the system, and those which are merely for a little mucus to lubricate the membrane. Does Mr. Headland mean to inculcate that each of these three excretions, after they are formed in the glandular apparatus which separates their elements from the blood and combines them into the necessary products, pass through a thin membrane? If he does mean this, I should like to have some evidence of it. If he does mean this, why is it not the same with the hydrothermal excretion from the skin, and the urinal excretion from the kidneys? Headland says that "this appears to be the reason why the eliminatives, which are volatile in nature, tend particularly to act on the two aëriform secretions, i. e. on that of the air cells of the lungs, and on the common cutaneous transpiration; for though the glands of the mucous membrane of the lungs secrete mucus, yet the chief object of the terminal portion of that membrane is to absorb and secrete the gaseous matters of the blood." (*Headl. Pg. 307.*) But do any of the supposed volatile eliminations act, or tend to act upon the two emunctory aëriform excretions from the bronchial membrane? Even if we were to admit such action, how could this affect Expectoration? Who ever thought of the vapor of Water or the Carbonic Acid, that are excreted from the lungs, as entering into the composition of the matter Expectored? Who ever thought of increasing either of these emunctory excretions by way of promoting Expectoration? It is only the secretion from the mucous follicles that is ever Expectored. I can discover no reason to conclude that

volatile eliminatives have any more tendency to affect the aëri-form excretions than non-volatile eliminatives. The emunctory excretion from the skin is aëri-form, but is it more affected by volatile eliminatives than by any other? Both the emunctory excretions from the lungs are aëri-form; but I have yet to learn that volatile eliminatives affect them either more readily or more powerfully than any other. But the comparatively unimportant, in fact trifling secretion of mucus from the bronchial membrane, which is not at all an emunctory secretion, but intended only to lubricate this part or texture, and the less necessary even for this purpose, on account of the emunctory Hydrothermal excretion, is more affected by volatile eliminatives, because this membrane yields two emunctory excretions which are aëri-form, though the mucous secretion itself is a comparatively thick and viscid liquid! As appears to me, this is a perfect non sequitur.

What is "the terminal portion" of the mucous membrane of the lungs? How does it appear that "the chief object" of the portion so called is "to absorb and secrete the gaseous matters of the blood?" I really have no conception of what is meant by all this. I can discover no reason for believing that the bronchial membrane absorbs any gasses, or excretes any that were previously in the blood. Headland says that "the effete gasses, which should be excreted by the bowels, are some times voided by the lungs, in cases of aggravated Dyspepsia, causing tainted breath." "Just so may other adventitious elements of the blood, as these volatile medicines, be some times excreted by the pulmonary membrane." "But they may pass-off by the skin, or by the urine, and would not then act upon the lungs at all." (*Headl. Pg. 308.*) Now I view this whole matter in quite a different light. What are the adventitious elements of the blood? Do the gasses that are often found in the intestines previously exist in the blood? The gasses of the intestines, as appears to me, do not previously exist in the blood, but are made what they are by the peculiar action of the secretories (doubtless by the mucous follicles) which pour them out under vitiated action unquestionably. When these gasses are simple, they are doubtless separated from some combination in the blood by the secretories. When they are compound, their elements appear to be combined, in the form in which they are found, by the same secretories. It is doubtless

just so with the gasses exhaled from the lungs; and I think it altogether the most probable that all the fetid and offensive ones are furnished by the mucous follicles under vitiated action, rather than by the Hydrothermal or Anthracagogue excretories. Neither milk, semen, saliva nor natural mucus ever preëxist in the blood, nor any other secretion whatever; but they all are elaborated from the blood by the glandular apparatus which secretes them. In fact, a portion of the blood is decomposed and recomposed into a new form, in and by the respective glands which produce them; and this is no less the fact when these secretions become vitiated, than it is while they are healthful as respects their action.

But will even the mucons follicles of the several mucous membranes produce the same identical morbid secretions; and much more, will the skin and the kidney make the same excretions as the mucous membrane of the intestines? The affirmative would seem to be Mr. Headland's opinion, since he appears to suppose that a f . . t may just as well pass-off by the lungs, or the skin, or the kidneys, as by the intestines. If these compound fetid gasses exist ready formed in the blood, why do they not some times escape by the openings made in the coats of the veins for the purpose of Depletion of Blood? Why should morbid secretions differ from those of health, as respects the manner in which they are formed? Headland inculcates that "the function of the pulmonary membrane (as of the skin) is absorption as well as excretion." He says that "under certain circumstances, some of the above mentioned substances may be thus absorbed." "The breathing of an atmosphere impregnated with the vapor of Turpentine, may cause the urine to acquire the characteristic odor of Violets." (*Headl. Pg. 307.*) I know of no evidence that it is ever a normal and healthful function of the bronchial membrane to absorb any thing; and as to the skin, I consider that its once supposed absorbing power has been absolutely disproved. Elaborate experiments and observations upon the latter subject were once made in Philadelphia, and as always seemed to me, with the most unequivocal results, Camphogen or Oil of Turpentine has not a Violet odor, so far as I could ever perceive. Whatever the substance may be, to which this odor pertains, it would seem to be a new chymical compound. Change of external sensible properties, I believe, always indicates change of composition.

The fact that after the system has been under the influence of this agent for some time, there is often a Violet odor of the urine, furnishes no reason for supposing that it has been absorbed. The fact that the protracted respiration of Camphogen or Oil of Turpentine produces disease affords no proof that this article, as such, is ever absorbed into the system.

"These medicines and others like them, are thus excreted by the air-cells or mucous glands of the pulmonary surface, and while thus passing-through, they stimulate the latter to a right performance of these functions." "When, as in the case of Bronchitis the secretion of mucus is increased in amount, or deteriorated into a purulent matter, they may be of service by causing the healthy secretion to replace the diseased one." (*Headl. Pg. 307-8.*) Does the fact that the true odorous principle of an article that has been swallowed, remains about the person, indicate that it is excreted intirely by the mucous follicles, or by the thermagogue or anthracagogue excretories, or that it passes-off from the bronchial membrane by endosmosis? I think not. Must an intire medicine pass-through the mucons follicles, in order to remedy vitiated action in them; and must this remedial effect be accomplished by stimulation i. e. by a quickly diffused and transient increase of vital energy and strength of action? I think I have shown the contrary, in the early part of this work.

Mr. Headland mentions Bronchitis; but what is Bronchitis in contradistinction from Pneumonitis? I have mentioned seven species of acute Pneumonitis, the topical Phlogosis of four of which extends to all the proper pulmonary textures. Each of these is Bronchitis; but it is some thing more; it is a Pneumonitis. Of the seven species of acute Pneumonitis, which I have mentioned, the topical Phlogosis of three is confined to the bronchial membrane. These are what I have hitherto been in the habit of calling Pneumonitis Typhodes-Erythematica; Pneumonitis Typhodes-notha; and Pneumonitis Typhodes-Catarrhalis. But all physicians call these several diseases Pneumonitis, and I have always followed the usage. If acute diphtheritic Phlogosis happens to begin in the trachea rather than in the larynx, and is neglected or ill treated in its early stages, so that it passes onward to a fatal termination, it destroys life by diffusion over the whole bronchial membrane, so as to interrupt its Anthracagogue func-

tion; and it does this before there has been sufficient time for such an effusion of coagulable lymph as to form a false membrane; so that without a due knowledge of the laws of the disease, the immediate cause of death may be mistaken. Such a case is strictly a Bronchitis; but such and so prominent are the peculiarities of this malady, that I consider it as constituting a distinct genus under the denomination Bronchlemmitis, etc. as John Mason Good does. There is a chronic Strumous Phlogosis of a greater or less patch or portion of the bronchial membrane, which begins with a lax and spongy turgescence of the part; sooner or later followed by redness and tenderness or soreness; and this by a granular appearance of the surface like that of a healing Ulcer; and this again by a very viscid and adhesive secretion; and this still farther with an irregular and jagged ulceration; etc. the whole attended with Cough and Expectoration, Hectic, night-sweats, a natant furfuraceous cloud in the urine, Diarrhœa, etc. and gradually progressive emaciation and exhaustion. The topical Phlogosis of this malady, though usually commencing in the bronchial membrane proper, and therefore being primarily a Bronchitis, some times begins in the fauces, being primarily an Isthmitis; some times in the larynx, being primarily a Laryngitis; some times in the trachea, being primarily a Tracheitis; in each of which cases, it may ultimately extend downward till it reaches the bronchial membrane, and ends as Bronchitis. But this malady is usually, and as I think correctly reckoned as a species of the nosological genus Phthisis. I often see and hear mention of Bronchitis vaguely and loosely, when this term does not appear to mean any of the diseases just specified. When the term happens to be thus employed in my presence, and by a physician, I often endeavor to ascertain a little more definitely what is meant; but hitherto without success. This term seems often to be used like *bilious* before the name of a disease, or *Mister* before the name of a man, i. e. with no specific meaning of any sort.

As I have elsewhere said, there are doubtless such diseases as idiopathic Blennorrhœa; but I repeat, do these cases ever require Blennagogues? Does even Blennorrhœa bronchialis ever require Expectorants? Are there any other idiopathic diseases of the function of the secretion of mucus?

Headland says that Expectorants are very uncertain agents.

(*Headl. Pg. 273.*) It would have been much better if he had inquired whether there are any Expectorants? For myself I repeat I do not think that there are any; though there are Adenagogues some times (not often) increase the secretion from the mucous membranes as a part of a general operation upon the whole secretory and absorbent or glandular system. "For the same reason" (*Headl.*) "that the lungs are not general emunctories, and not be made use of, to produce a wholesale evacuation from the blood, Expectorants are of no use as general Antiphlogistics." (*Headl.*) says that "in this they differ from the four remaining groups of eliminatives," viz. "Cathartics, Cholagogues, Diaphoretics and Diuretics." (*Headl. Pg. 308.*) As appears to me (contrary to Mr. Headland's view) the lungs are positively a general emunctory, a double one too, since they eliminate all the effete Carbonaceous matter from the whole system, than which there is no more important excretion. In addition to this, they assist the skin in eliminating the effete matter of the system, though what proportion of this function they perform I know not. What does Headland mean by "a wholesale evacuation from the blood?" I suppose that if the blood were to be drained of their serum, so as to leave the crassamentum nearly as thick as Tar, by spontaneous vomiting and Diarrhoea or as the effect of drastic Hydragogue Emetics and Cathartics. Mr. Headland would consider this "a wholesale evacuation from the blood." How much short of this would be considered as a wholesale evacuation under this compound denomination, I can not pretend to decide. I certainly could not commend any thing like this as a suitable Antiphlogistic process for any disease; and certainly is no other of the "general emunctories" through which, what Headland seems to intend by "a wholesale evacuation from the blood" could be accomplished. Headland says that "the nature of this is that the pulmonary glands are not naturally intended to act as emunctories or dischargers of morbid matters from the blood, and thus are less proper to be excited by Eliminating medicines than other glands whose proper office is one of general Elimination." (*Headl. Pg. 308.*) But what is here meant by "the pulmonary glands?" There are, I believe, a few lymphatic glands near the upper part of each lung, at least this is a provision that I have had ever since I was a mere student in anatomy. But it is not at all probable that Mr. Headland

k of saying that "these are not naturally intended to act as excretories or dischargers of morbid matters from the blood." All excreting and excreting structures are essentially glandular. If Mr. Headland may mean either the Thermagogue, or the Anacagogue apparatus. But do these ever Eliminate or discharge morbid matters from the blood? It is strange how the medical profession continues to be haunted by the phantoms of the humoral pathology! For myself I do not hesitate to assert, and without the least fear of disproof, that disease consists in vitiated action, action or condition of the living solid; and does not depend in any degree upon any morbid matters either in the blood or in any other of the fluids, or even in the alimentary canal, which must be Eliminated by some one of the emunctories if the disease can be cured. I do not hesitate to assert, without the least fear of disproof, that all such notions are groundless as any Fairy-tale. It is the most likely after all, that by "pulmonary glands," mucous follicles are intended. The mucous follicles are certainly not emunctories of the system, so that even if disease depended upon such morbid matters as I have just mentioned, they could afford no assistance towards Eliminating them. The function of the mucous follicles is indeed a very insignificant one, as I have said, they only furnish a little lubricating matter to the mucous membrane itself, which is less necessary for the tracheal membrane than for any other, since that constantly exhales so much vapor of water, which to a certain extent, seems capable of supplying the place of the mucus. But does the excretion from either of the general emunctories ever prove Antiphlogistic? I never knew that Diuresis was ever employed as an Antiphlogistic process; though many Diuretics possess a direct Antiphlogistic power, wholly and intirely separate from their Diuretic power. Mere Diaphoresis is certainly not an Antiphlogistic process; though a Diaphoretic may possess an Antiphlogistic power in addition to a Diaphoretic one. As to true and proper Cholagogues, I know of no evidence of the existence of any such agents. Certain Adenagics (I think) some times increase the secretion of bile slightly, as a part of a general operation upon the biliary secernent and absorbent or glandular system. Again an emetic Cathartic, when so managed as to be long in producing its cathartic effect, and yet, when it does operate, to operate rather dras-

tically, frequently produces a moderate increase of the secretion of bile; but all the bile that I ever knew secreted in the course of twenty-four hours, if it had taken place in the course of an hour, could not possibly have been an Antiphlogistic evacuation. I have no knowledge that the greatest variation in the amount of the biliary secretion, that ever takes place in the course of a week, is ever in any degree instrumental, either in the production or the cure of any malady whatever.

Even simple and pure Catharsis can hardly be said to be Antiphlogistic. It is true that particular Cathartics possess a direct Antiphlogistic power in addition to their Cathartic one. Particular Cathartics incline to operate Hydragogically, and by diminishing the mass of the circulating fluid, produce a certain amount of Antiphlogistication. Ecbalium Elaterium one of the most efficient Hydragogue-Cathartics in the whole materia medica, is never, to my knowledge, used as an Antiphlogistic.

But do either of the four great emunctories of the effete matters of the system ever prove Antiphlogistic by the mere Elimination of these effete matters? I think not. I do not know that either of these is an Antiphlogistic Elimination, any more than Expectoration. Strictly speaking, there are no Antiphlogistic evacuations except that of Blood by phlebotomy or arteriotomy, and this not by the abstraction of the non-vital serum in which the vitalized crassamentum is diffused, but by the abstraction of this living crassamentum itself.

I have often heard indirect Expectorants mentioned. It may be well in this place to inquire what these are. As appears to me, the process most commonly called Expectoration is much oftener produced by Adenagics than by any other class of agents. They produce it directly too, but only as a part of a general operation upon the whole secernent and absorbent or glandular system. They are often reckoned true Expectorants; but they are no more such than they are true Diuretics, true Diaphoretics, etc.

Expectoration is commonly said to be produced by Emetics. I believe that the act of Vomiting, so long as it lasts, ordinarily increases secretory activity in the whole secernent and absorbent or glandular system, so that it proves Expectorant only as a part of a more general operation. Its Expectorant effects then would

seem to be direct ones. The notion that Emetics ever prove Expectorant by concussing, compressing and squeezing the lungs, always appeared to me to be perfectly ridiculous; and yet this is still the purely mechanical mode, in which their supposed indirect Expectorant effect is produced. Neither of these then can be reckoned as indirect Expectorants.

In an exquisitely phlogistic Pneumonitis that has passed the stage of direct early resolution, proper Antiphlogistication often occasions that sort of resolution which is immediately succeeded by profuse mucipurulent Expectoration. This Expectoration is doubly the indirect effect of the Antiphlogistication, since this process first occasions the resolution and the resolution occasions the Expectoration.

It has been a prevalent opinion, within my acquaintance, that Leantics (so called by me) by obviating irritation, might indirectly promote Expectoration; but I suspect that this is rather a matter of theory than of fact resulting from observation. Certain of the articles which I call Neuragics are believed by many of my acquaintance, to be capable of operating as indirect Expectorants, in a manner analogous to the operation of the Leantics. But I never witnessed any such operation. It is supposed by some that Papaver, which is an active Narcotic, some times, by powerfully obviating irritation, occasions that resolution of certain Pneumonitides which are highly atonic, which is followed by mucipurulent Expectoration, and is thereby entitled to be reckoned an indirect Expectorant; and hence the Narcotics generally have been said to be indirect Expectorants. Though Papaver may be capable of operating in this manner, I doubt whether any other Narcotic is. The most active Oresthetics are supposed some times, by obviating torpor, insusceptibility and prostration, to occasion that resolution of certain cases of atonic Pneumonitis which is followed by mucipurulent Expectoration, and so have been considered as indirect Expectorants. I am not exactly prepared for a confident decision of this point, one way or the other, since I do not now recollect any cases that contribute to such a decision. At some other time, I may recollect some such. In some of the exquisitely atonic Pneumonitides, I have heard it maintained that what I call Antisbestics, given at the right period will cause that resolution which is followed by a mucipuru-

lent Expectoration, when without their aid, it would not have taken place. I doubt not that this is true; but I doubt whether such an operation entitles Antisbestics to be reckoned even as indirect Expectorants as some suppose. Certain Tonics are supposed to be capable of proving indirect Expectorants, in certain stages of certain cases of exquisitely atonic Pneumonitis, just as I have described the Antisbestics as some times doing. I think I have seen such an operation from Cinchona in Pneumonitis Typhodes-notha. For myself I have great doubts of the propriety and expediency of reckoning any of these as even indirect Expectorants.

The real influence of a true Chremptic or Expectorant, as will be obvious, must be exerted primarily on that portion of the involuntary motor nerve of chymical action, nutrition, etc. which is sent to the mucus follicles of the bronchial membrane.

A brief consideration of some of the most important diseases in which what are called Expectorants, i. e. Chremptics, are commonly prescribed, will assist us in forming a judgment of their remedial value. Headland says that Expectorants "are only employed in pulmonary disorders when we desire to influence the amount or character of the mucous secretion, when the mucous membrane is inflamed or irritated." (*Pg.* 308.) But let it be remembered that in symptomatic cases of disturbance of the function of the mucous follicles of the bronchial, and every other mucous membrane, it is sufficient if the primary disease is well treated, since the mucous follicles will be spontaneously and readily restored to health, on the removal of the primary disease. In the incipient or forming stage of entonic Phlegmonous Phlogosis of the lungs, in which all the textures are involved, the constitutional febrile affection being a Cauma,* the mucous excretion is first slightly increased merely, and when the disease is fully formed, it becomes streaked with blood. If a resolution of the disease is produced in its early stage the mucous excretion is simply restored to its natural state. If a resolution takes place on the seventh day, it is usually attended with a copious mucipurulent excretion. But the medical treatment is not influenced by

*If I have occasion to refer to this disease hereafter, I shall call it *Pneumonitis Caumatodes-Phlegmonea*, the generic name indicating the seat of the Phlogosis; the first half of the compound trivial name indicating the species of Fever which is its constitutional affection; and the last half indicating the species of the Phlogosis.

these several phenomena of this excretion. If the disease is well managed this excretion takes care of itself; nor can it be varied except as the effect of a variation of the disease. There is a regular period of this disease, in which, according to its established laws, a preternatural excretion from the bronchial membrane takes place, viz. at the time of a resolution in its advanced or latter stage, i. e. almost always on the seventh day; some times as early as the fifth; and much more rarely as late as the ninth; and this excretion takes place when no medicines ever called Expectorants are employed; and it can not be produced at any other period of the disease, even by the most free use of what are called Expectorants. No such excretion takes place when there is a resolution in the first stage. It is proper to remark here (though the same thing must be mentioned in an other place) that many of the most important articles commonly called Expectorants, are efficient Adenagics, and are capable of contributing greatly to the production of a resolution of some other species of this disease, but not of this species; though whether the resolution which they contribute to produce, is immediately succeeded by a preternatural excretion from the bronchial membrane or not, depends wholly upon the stage of the disease at which it takes place, and not at all upon the article employed under the name of an Expectorant. A number of efficient Antiphlogistics intirely destitute of any Adenagic power are called Expectorants merely because they are capable of contributing to a resolution of this disease without Expectoration, if the resolution occurs in the first stage, and with it, if it occurs in the last stage. Now Antiphlogistics properly employed are altogether the most important remedies for this species of Pneumonitis; but they benefit merely by their Antiphlogistic power, and not by any other power which they may happen to possess in conjunction with it.

There is an atonic Phlegmonous Phlogosis of the lungs, affecting all the textures, the constitutional Febrile affection being a Typhus nervosus. This occurs only in warm climates, or in subjects that have resided in a warm climate, but have left it, having had a quick passage to a cold one, and reached the latter during a cold season. I have been in the habit of calling this specific disease Pneumonitis Typhodes-Phlegmonea. As near as I now recollect, the excretion from the bronchial membrane in the early

stages of this malady, is much like that of entonic Phlegmonous Phlogosis of the lungs. Its early resolution is unattended with any increased bronchial excretion, while its resolution upon the seventh day is attended with a profuse mucipurulent excretion. This species of Pneumonitis under injudicious treatment, is very liable to degenerate into a kind of Phthisis, which Dr. James Johnson called Mediterranean Phthisis. If treated mainly by Antiphlogistics this is almost always the result, unless a Vomica is formed or an Empyema takes place. In this disease suitable Adenagics are always useful, but Antiphlogistics are always injurious. The former do not render service by the production of a preternatural excretion from the bronchial membrane, but by contributing to the production of a resolution of the disease, either without, or with a preternatural excretion from the bronchial membrane, according to the stage. The latter, viz. Antiphlogistics would contribute to hinder resolution in both stages in which it is capable of taking place, because this disease is perfectly atonic; and therefore it would contribute to hinder the preternatural excretion which only follows, but never causes the resolution that takes place in the advanced or latter stages of the disease.

I have witnessed both a Podagric and a Rheumatismal Phlogosis of the lungs, both of which affect all the textures. In these the excretion from the bronchial membrane has been a thin mucus a little streaked with blood, a symptom, to all appearance, of very little importance. The constitutional febrile affection in both of these Pneumonitides, under my observation, has been irregularly exacerbating and remitting, with night-sweating, and a constant furfuraceous cloud in the urine, and I have always considered it as acute Hectic. Both of these diseases, as I have seen them, have terminated by a kind of metastasis, i. e. the pulmonary affection has subsided and the Phlogosis has appeared in some external part. These forms of disease I call Pneumonitis Hectica-Podagrica, and Pneumonitis Hectica-Rheumatismalis.

The Erythematic Phlogosis of the lungs, which is always confined to the bronchial membrane, the constitutional febrile affection being a Typhus putridus, the mucous follicles pour-out what seems to be an intimate mixture of much thin and watery mucus with pure blood; and yet this greatly vitiated excretion requires no peculiar treatment for itself. If the disease as a whole, is

well treated, this excretion will become normal, as the patient recovers.

In that atonic Phlogosis of the lungs, which is called Pneumonitis Typhodes-notha, in which the Inflammation is confined to the bronchial membrane, and is of the same specific nature as that of the mucous membrane of the smaller intestines in Dysentery, the constitutional febrile affection being a Typhus nervosus, the mucous follicles pour-fourth, some times a milk-like, but oftener a brine-like excretion; but no prescription need ever be made to this. If the disease as a whole is well treated and is materially mitigated or greatly relieved, all the peculiarities of this excretion soon disappear, and it assumes its natural state.

I am well acquainted with a Catarrhal Phlogosis of the lungs always confined to the bronchial membrane. In the disease in view the Phlogosis does not extend to the Schneiderean membrane. I am not quite sure of the specific nature and character of the constitutional febrile affection, but I rather think that it is an obscure Typhus nervosus. I have always been in the habit of calling this disease Pneumonitis Typhodes-Catarrhalis. As near as I now recollect, there is little Expectoration in the forming and early stages of this disease, and what there is, is not at all discolored. A resolution is some times produced in its early stage without any increase of the secretion from the bronchial membrane; but if the resolution does not take place till the seventh day, it is attended with a mucipurulent excretion. But this is evidently a mere effect of the resolution, and in no degree the cause of it. I never could discover that either the quantity or quality of the excretion from the bronchial membrane ever had any connection with the production or cure of these diseases except as a sequel. Yet each of these several species of Pneumonitis produces an increased, and more vitiated excretion from the mucons follicles of the bronchial membrane, than that of Blennorrhœa bronchialis—an excretion so peculiar that each species may generally be identified by it, or at least by the aid of a very few other symptoms. But no medicinal agent is ever capable of producing any thing like the characteristic secretions of the several species of Pneumonitis.

I have now mentioned all the specifically distinct Pneumonitides with which I am acquainted; and I have mentioned them

because they are the diseases in which Expectorants are commonly supposed to be of the most therapeutic importance. If we possessed true and proper Expectorants, i. e. articles operating directly and exclusively to increase secretory or excretory activity of the mucous follicles of the bronchial membrane, without affecting any other of the mucous membranes or any other part of the secernent and absorbent or glandular system; or if we had true and proper Blennagogues i. e. articles operating directly and exclusively to increase the secretory or excretory activity of the mucous follicles of all the mucous membranes, without affecting any other part of the secernent and absorbent or glandular system, I do not think that either would be of any value whatever in the treatment of any of these diseases. At the time of the resolution of several of the Pneumonitides, provided it is not in the first stage, a profuse mucipurulent excretion takes place; but this is sequelar to the resolution, and by no means the cause of it. The occurrence of this excretion certainly does not produce the resolution, but on the contrary, the resolution produces the Expectoration. As the patient recovers, the secretion gradually becomes normal.

There are at least six distinct species of Phthisis, each of which is peculiar in comparison with the rest, beginning, progressing and terminating in its own peculiar way. These several species never change into each other in their course and progress. The symptoms and circumstances that associate these species into a true and natural genus, are the facts that they are all chronic; that their topical seat is some part or texture of the lungs; that to all external appearance, they begin with a cough, which is at first dry, but sooner or later is accompanied with Expectoration, in the beginning small, but soon becoming copious and often very profuse; attended with Hectic, night sweats; a natant furfuraceous cloud in the urine; and sooner or later Diarrhœa. These symptoms in the aggregate, accompanied from the beginning with gradually progressive emaciation and exhaustion, decide the reference of the disease to the nosological genus Phthisis. The species of this genus Phthisis depend upon six different pathological conditions of the lungs. These it is not necessary to specify for my present purpose. Now, I have never happened to meet with a physician not one of my own associates or pupils, or an associate

or pupil of some of these, who did not consider the production of Expectoration, before it had taken place spontaneously, and its augmentation after it had taken place, as the chief indication of treatment in this disease. I have been one of a council at the bed-side of a patient, all the members of which I esteemed truly eminent—they were in fact too much so to be at all influenced by me—which patient was then Expectoring more than two pints every twenty-four hours, when the opinion was unanimous (me solum excepto) that this Expectoration was not only to be kept-up, but still further augmented. Of a considerable number of such councils I can say minima pars fui; but with every opportunity for observation that I ever had, I have never discovered the benefit, the propriety or the expediency of “promoting Expectoration” (as the usual language is) in any species of Phthisis. I have never been able to ascertain the end or object of producing Expectoration in Phthisis when it has not already begun, or of increasing it when it has; though I have often inquired for it of those who recommended such a course. What possible service can such a discharge render to any of the various topical affections, which constitute the several species of Phthisis? It is quite certain that such a drain can not improve the condition of the system at large. Certainly while it exists the Cough can not be suspended, for so long as it is poured into the bronchial tubes, it must be rejected, and it can not be rejected without more or less Coughing. This excretion therefore keeps-up the Cough, and the Cough augments the secretion. I think that the existence of this excretion adds materially to the wasting and exhausting effects of this disease. Whenever such an excretion is established before I am called to take charge of a case, my first endeavor is to diminish it as rapidly as possible, and to arrest it wholly as soon as may be in my power. How can any practitioner of medicine who is constantly endeavoring to augment this excretion, ever expect to cure a case, since, so long as it continues, the patient must cough in order to reject it, and so long as he coughs and Expectorates he must continue to emaciate and become more and more debilitated, and so long as he is in a state of exhaustion and inanition he will have Hectic; and if Cough, Expectoration, inanition and exhaustion remain, and much more if they progress, they must sooner or later wear out any subject whatever. A case

of mucus to disease can not be very important. I can not now call to mind a single case in which the production of Expectoration is remedial either of any individual symptom, of any aggregate of symptoms or of any specific disease. In fact I know of no disease in which an increase of the excretion from the bronchial membrane is indicated—none in which it is of any remedial service. So far as I know, all preternatural secretions from any of the mucous membranes, and from the bronchial membrane by way of eminence, constitute disease.

As appears to me, it may eventually be found that there are agents in the *materia medica* capable of acting directly and exclusively to increase the activity of the four great emunctories of the system, viz. 1. The intestinal canal, the excretory of the refuse of the food; 2. The renes and their appendages, the excretory for all those substances that are capable of passing-off in the form of Salts in solution in water; 3. The lungs, the excretory for the effete Carbonum of the system, which is converted in this organ into Carbonic Acid-gas and expired or exhaled; 4. The skin and lungs, which in conjunction are the excretory for the effete heat, which is rendered latent with water by these organs, and thus passes-off. In my view these are the only true therapeutic evacuations that are now capable, or will hereafter be found to be capable of being produced by medicine, and that are, or will be of any value as remedial evacuations.

It is true Depletion of Blood is a remedial evacuation; but this is not produced by medicines, but by a surgical operation. As to Emesis or Vomiting, I do not think that it ever proves medicinal as an evacuation, but always by means of its shock, or other impression, through which it changes, counteracts or overcomes morbid action and condition, and prepares the way for the restoration of health; and all this I believe it accomplishes much less frequently than is commonly supposed. As to Emmenagogy, I do not think that it is ever of the least service as an evacuation. When the catamenial secretion has been morbidly suspended it is often useful to restore it; and when benefit is derived from this, it results not from any evacuation which is occasioned, but from the restoration of a suspended function. As respects an increase in the secretion of the mucous follicles I think that it is never a useful evacuation, though it is some times an exhausting drain.

Its increase by medicine, if indeed this is ever practicable, never appeared to me to be of any remedial benefit; and on the most careful reconsideration of the subject, it does not appear to me to promise any benefit.

But it will doubtless be said that we have no articles capable of directly and exclusively increasing the excretion of the effete Carbonum of the system. So far as I have knowledge this is true; and happily we seem to have but few diseases in which this appears to be required. There are some however in which this function is imperfectly and inadequately performed, as would seem, from defective power or loss of functional energy in the pulmonary branch of the nerve of chymical action nutrition, etc. It would seem as if true and proper Anthracagogues would be appropriate for such cases; and I know of no other. Such agents may yet be discovered, though hitherto unknown.

The synonymy of this class is as follows, viz. *Expectorantia*, ? *Apostethistica*, ? *Ecpneumonica*, ? *Chremptica*, *Anacathartica*, *Pectoralia*, *Bechica*, *Blennagoga*, *Myxagoga*, *Phlegmagoga* vel potius *Phlegmatagoga*. The first of these names is Latin, as already explained and discussed; and the second is its exact Greek equivalent. The third and fourth are Greek of the same essential import. The former of these implies some thing from the lungs. The latter has been already explained. The fifth term literally signifies *upward-purgatives* i. e. in other terms *Emetics*; but it has been applied to Expectorants so called, (I suppose) because Expectoration is considered as the same thing in relation to the lungs and trachea, as vomiting is to the stomach and œsophagus. It always appeared to me that this term should have been *Anocathartica* instead of *Anacathartica*; but I believe that there is lexicographical authority for giving the Greek *ana*, when in composition, the sense of *upward*. Cullen defines *Anacathartica* to be "medicines *purging upwards*, and some times employed for *Emetics*, some times for *Salivants*, but most commonly implying, according to the original sense in which the term was employed by Hippocrates, *Expectorants*, or medicines promoting the ejection of matter from the lungs, whether mucous or purulent." (*Cull. Mat. Med. B. S. Bart. Edit. Philad. 1812, Vol. I, Pg. 110.*) The term *Pectoralia* is pure Latin, and is an attribute signifying *having relation to the breast or chest*. So

far as respects its intrinsic signification, it might as well be applied to articles that restrain Expectoration, as to those supposed to promote it. But much read authors some times employ it in the sense of Expectorants, and some times in some other sense. Cullen says that "Pectoralia" are "medicines suited to diseases of the breast." He adds, "employed in that general sense, it is absolutely improper, and has certainly led to abuse." He continues "as it is at present commonly employed in the same sense as the term Expectorant, it might perhaps be allowed; but certainly the latter term, as more precise, ought to be the one commonly made use of." "If" (adds Cullen) "the Pectoralia may, with Mr. Lieutaud, be of three kinds, Demulcentia, Astringentia and Resolventia, it will be very obvious that the general term may be liable to much abuse." (*Ibidem*, Pg. 121-2.) But Lieutaud says "les poumons, ainsi que les autres visceres, sont sujets, comme tout le monde sait, à des maladies de différentes especes; c' est pourquoi les médicaments qui sont consacrés au traitement des maux de poitrine, sont de différente nature." "Nous avons cru pouvoir les réduire à trois classes; nous comprendrons dans la *premiere* les adoucissants et les anodins; nous rassemblerons dans la *seconde* les *vulnérables*, les *détersifs* et les *astringents*; la *derniere* enfin, sera destinée aux *résolutifs* et *incisifs*." (*Lieutaud Précis de la Matière Medicale. A Paris, 1776, Tome premier* 546.) Here are in fact more than three kinds of Pectoralia, though Lieutaud numbers them as only three. "Les adoucissants, et les Anodins" are certainly not the same according to such authors as I have been the most familiar with. Again, if les *vulnérables* et les *détersifs* are the same, surely les *astringents* differ from them. "Enfin," as our author says, *résolutifs* et *incisifs* may be the same, without reducing the whole of them "à trois classes." Indeed I can not possibly make less than *four*, and most authors would number them as seven.

Among those physicians with whom I have been in habits of intercourse the term Pectoralia has been most commonly used in the sense of Tonics of the breast or chest, or the several organs that constitute the thorax. Ever since I have been in the practice of medicine I have been in the habit of hearing patients complain of weak breast or chest. Whenever I have investigated really serious cases of this sort, they have seemed to consist in

greater or less loss of tone in the muscles that perform the respiratory motions, and this through their voluntary motor nerves, rather than the involuntary and expressory motor nerves. If the difficulty had been in the latter, it would have approached to what is commonly called Angina pectoris. For this weakness of the breast, it is customary with many physicians, to prescribe the solid and pure Resins, as Colophony for example; not as Expectorants, for there is neither Cough, nor any other difficulty of the lungs proper, but as Pectorals, so the language was. I can not say however, that I ever witnessed any benefit in these cases from these Resins. I do not think that such a vague term, with such vague applications, should be tolerated in medicine.

Lientaud seems to give the term *bechiques* or *bechica* as a synonym of *pectoraux*, so far as the latter term comprehends the *adoucissants* and the *anodyns* but apparently not so far as to comprehend the *vulnérables*, the *déterifs* et *astringents*; nor the *résolutifs* et *incisifs*. Cullen says that "*Bechica*" are "medicines suited to relieve Cough; which, as they may be of various kinds, the general term may mislead, and is therefore improper." (*Ibidem*, Pg. 115.) The real truth is that *Bechica* is a mere attribute implying pertaining to a Cough; or relating to a Cough; and if we possessed any articles that would produce a Cough, this term by its intrinsic signification, would be just as applicable to them, as to articles that will restrain a Cough. The term *Antibechnics* would imply remedies for a Cough; but there are no articles that are *Antibechnics*, except by virtue of some power already the foundation of a class in the *materia medica*. Certainly an Expectorant power is not an *Antibechnic* one. Such an operation is much more likely to increase a Cough. In fact, as I have elsewhere said, so long as there is a preternaturally augmented secretion from the bronchial membrane, there must be more or less Cough to cause its rejection, otherwise the patient would suffocate from the accumulation of such augmented secretion, because, in all probability, what little upward peristaltic action there is in the trachea and its bronchial ramifications, is inadequate to its removal. If this is true, both Expectorants and Blennagogues ought to increase Cough, as well as the secretion from the bronchial membrane, to prevent mischief from them.

Papaver is the only direct and efficient *Antibechnic* within my

knowledge; and I can not doubt that it produces this effect solely by its Narcotic power, though by a peculiarity of it, since no other Narcotic operates in this manner in any thing like the same extent, or under the same grade of its effects. All the Narcotics that destroy life by suspending the functions of the nerves of expression will allay Cough when pushed so far as to diminish this function; and Papaver is one of these; but its peculiarity is that it will powerfully allay Cough without being pushed so far as to affect the healthful or rather natural performance of the function of these nerves in an appreciable degree.

Blennagoga, Myxagoga and Phlegmagoga, or upon correct principles, Phlegmatogoga have been already sufficiently explained.

PROËM TO THE CLASS EMMENAGOGA.

The term Emmenagoga is made-up of an ancient classical Greek noun-substantive signifying the monthly hematoid uterine excretion of women, which occurs between the second and the sixth or seventh climacteric periods, and an ancient classical Greek attribute, which has been explained in connexion with three at least of the preceding classes. The term Emmenagogia or Emmenagogy, to denote an Emmenagogue operation or effect, is legitimately formed and appropriate in all respects, and in analogy with several other terms that have been already mentioned and employed.

Definition. True and proper Emmenagoga (if there are in fact any such agents) either are or should be articles which by a direct and exclusive operation upon the catamenial excretories of the uterus, produce the catamenia when they are retained or suppressed, and increase them when they are deficient in quality; and this without either augmentation or diminution of vital ener-

gy or strength of action in any part of the system, but merely by increase of excretory activity.

According to my definition, an Emmenagogue true and proper ought to act primarily upon that part of the involuntary motor-nerve of chymical action, nutrition etc. which is sent to the catamenial excretories of the uterus. The essential part of an Emmenagogue operation—that which takes place in all cases, is merely an increase of activity in the excretories, intirely independent of any augmentation or diminution of vital energy, power or strength of action.

I shall quote a very few definitions from some of the most common works on the materia medica, for the purpose of showing the received notions in regard to the Emmenagogues, rather than from any expectation of throwing any additional light upon the difficulties of the subject. Hooper says that “whatever possesses the power of promoting that monthly discharge by the uterus, which, from a law of the animal economy, should take place in certain conditions of the female system,” is an Emmenagogue. (*Hoop. Lex. Med. 4th Amer. Edit. N. Y. 1829, Vol. I, sub voce.*) It is obvious that this definition would comprehend not only all the Adenagics, that are ever employed for the production of Emmenagogy, but also all those agents that ever produce this effect indirectly. Indeed one author himself gives an explanation of his definition which amounts to this. Hooper says that “the articles belonging to this class are” 1. “Stimulating Emmenagogues as Hydrargyrine and Antimonial preparations;” 2. “Irritating Emmenagogues as Aloë, Savin and Cantharis;” 3. “Tonic Emmenagogues as Ferruginous preparations, Cold Bath and Exercise;” 4. “Antispasmodic Emmenagogues as Assa-fœtida, Castoreum and Pediluvia.” (*Ibidem.*) In the whole of this list, I need hardly say, there is not a single true and proper Emmenagogue, though there are a number of Adenagics, as the Hydrargyrine preparations, Savin, and possibly Assa-fœtida may possess this power in a slight degree.

Pearson says that Emmenagoga “are those medicinal agents which are employed to promote the menstrual discharge, being for the most part of a stimulant nature, their administration is improper in plethoric and inflammatory conditions of the body.” “They are especially adapted to those cases of obstructed and

suppressed menses, in which there is a deficiency of animal heat, and a want of energy in the circulating system." (*Pract. Synops. Mat. Aliment. & Mat. Med. by Richd. Pearson, Lond. 1808, Pg. 271.*) Pearson's proper definition, without his qualification, is as broad and comprehensive as Hooper's. His statement that the Emmenagogues are mostly of a Stimulant nature would seem to limit them within very narrow bounds; and yet this seeming is doubtless fallacious, since Pearson would unquestionably consider every thing as Stimulant that proves Emmenagogue, whether directly or indirectly.

Cullen says that "Emmenagoga or Menagoga" (are) "medicines suited to promote the menstrual flux in women, or to excite and restore it when retained or suppressed." (*Cull. Treat. Mat. Med. by B. S. Bart. Philad. 1812, Vol. I, Pg. 120.*) This definition also comprehends not only Adenagics, but every thing else that ever produces Emmenagogy, whether directly or indirectly. Cullen adds that "we can not absolutely deny such a power in medicine, and therefore the use of the term; but I would have it cautiously admitted, as I am of opinion that in a hundred instances it has been employed without reason." (*Cull. Treat. Mat. Med. by B. S. Bart. Philad. 1812, Vol. I, Pg. 120-1.*) This indicates that Cullen had some notion of a limitation of the term Emmenagogue, which his definition does not express, and that in fact, he rather doubted the existence of any agents justly and truly belonging to such a class.

J. Moore Neligan says that "Emmenagogues are medicines which are supposed to be capable of promoting the menstrual discharge." (*J. M. Neligan Med. Uses, Mode of Administr. 2d Edit. Dubl. 1847, Pg. 162.*) Neligan adds "that any substances have a direct or specific power over the uterine organs has been doubted by many, in consequence of the uncertainty of the operation of the so called specific Emmenagogues, and also as the uterus is not an organ intended for the elimination of foreign matter." Neligan says "but there are a few medicines which are employed to promote the menstrual secretion, and which appear to act solely as Stimulants to the uterus, and these alone will be considered." (*Ibidem.*) Neligan's definition has the same latitude with all the rest; and yet his qualifying remarks seem to look to a restriction which his definition by no means makes.

Murray says that "the medicines distinguished by the appellation of Emmenagogues are those which are capable of promoting the menstrual discharge." (*John Murr. Syst. Mat. Med. and Pharm. fr. 4th Edinb. Edit. by J. B. Beck, N. York, 1828, Pg. 204.*) Saying that what are called Emmenagogues promote the menstrual discharge is assuredly not a very logical definition, nor one that requires comment. John Murray says "it seems possible a priori that there may be substances disposed to act more peculiarly upon the uterine system; yet experience does not confirm this supposition; there being no proof perhaps that any of the substances styled Emmenagogue produce their effect from any specific power." Again John Murray says that "it is sufficiently certain that there are many substances, which, when removed into the stomach, have their Stimulant operation more particularly determined to one organ than an other." But he adds that "it is doubtful whether there is any particular determination to the vessels" of the uterus. (*Ibidem.*)

I do not observe that Mr. Headland has any such class of remedial agents as Emmenagoga and therefore I suppose that he did not admit the existence of such a class.

Swediaur says "Menagogum specificum nullum novi præter terrorem subitum." (*F. Swed. Mat. Med. Paris. Ann VIII, Pg. XII Conspect.*) In fact all of our authors on the materia medica seem to doubt the existence of any true and proper Emmenagogues, though all their definitions are so made-out as to comprise many of the Adenagics, as well as all of those articles which ever produce Emmenagogy by an indirect operation; such for example as the invigorants whether Antisbestics or Tonics. For myself I have no knowledge of any true and proper Emmenagogue; and a considerable number of authors testify to the same effect. Stephenson & Churchill have evidently been disbelievers in our knowledge of any true and proper Emmenagogues, since they say "if Ergot is capable of producing such an extraordinary effect" (upon the uterus) "we would ask why we should despair of finding direct" (doubtless meaning true and proper, because Adenagics are really direct) "Emmenagogues, or medicines capable of producing a flow of the catamenia, by their own peculiar or specific action on the uterus." (*Steph. & Church. Med. Bot. Burn Edit. Lond. 1836, Vol. III, Article 176.*) But these gen-

tlemen maintain that there is now one Emmenagogue known, which directly produces Emmenagogy "by its own peculiar or specific action on the uterus" and "unaccompanied by any other sensible effects." This supposed Emmenagogue true and proper is an old article of the materia medica, which has been left-out of all the later works on this subject, viz. *Chenopodium Vulvaria* (*Linn.*) *C. olidum* (*Curtis.*) Samuel Dale M. D. says of this article "uterina est; menses provocat; foetum mortuum secundinamque expellet; in Hystericis multum prodest." (*Supplem. to Pharmacol. Lond. 1705, Sect. 3d, Par. 3d, Artic. 19, Pg. 56.*) Under the old name *Atriplex foetida* (*Bauhin.*) Cullen says of this article, "it is a plant of a remarkable foetor, and may be presumed from that, to be a powerful Antispasmodic." Cullen speaks highly of it for this power, though as would seem, rather from testimony than personal experience. (*Cull. Treat. Mat. Med. B. S. Bart. Ed. Philad. 1812, Vol. II., Pg. 257.*) This article is active only in its recent state, so that it can be taken only when beat to a pulp and made extemporaneously into a Conserve. Even in this form, with the best flavoring ingredients known, it is so disagreeable and even offensive that it is difficult to persuade patients to take it. *Chenopodium Vulvaria* grows almost all over Europe and the Northern part of Africa. Where it is indigenous, I suspect that no one can now say with certainty. It is occasionally found in the U. S. A. in the back-yards of crockery-shops, where their crates are unpacked, the seeds being brought across the Atlantic among the grass and straw used in packing. It is said to be regularly cultivated in some parts of England for medicinal use, and it might be in the U. S. A. just as well. Whatever powers are possessed by *Chenopodium Vulvaria* (*Linn.*) are doubtless possessed likewise by *Caroxylum foetidum* (*De Candolle*) popularly called Mulley, because it has "odorem foetidum *Chenopodii Vulvariae*." (*De Cand. Prodr. Syst. Nat. Reg. Veg. Parisiis 1849, Prs. 13, Pg. 178, Sub. Carox. foet.*) *Caroxylum foetidum* is indigenous "in Ægypto inferiore et superiore." Like *Chenopodium Vulvaria* it may be cultivated almost any where and every where.

But are these two articles true and proper Emmenagogues? Some points are yet to be ascertained, before we can confidently assent to this. They are probably moderate Euphrenics; but I do

not think that an Emmenagogue operation can possibly result from such a degree of this power as they can reasonably be supposed to possess. Are they Adenagics? I think that probability is strongly against it; and yet this should be carefully ascertained, since if they do actually possess this power, it will account for any Emmenagogue effects, without the possession of any true Emmenagogue power. According to Stephenson & Churchill, Mr. Houlton has tested the Emmenagogue powers of *Chenopodium Vulvaria* in a few cases, and confirmed it by experience. Mr. Churchill has likewise been successful with it in a few cases. It is said to be in extensive and successful popular use, in the neighborhood of Coggeshall, Essex; the knowledge of it (as is supposed) having been derived from Dr. Dale already quoted. It is said to be sold in large quantities in Covent-garden, being cultivated at Mitcham for the supply of the market. The amount sold is supposed to prove its efficacy, at least to a certain extent. It is alleged to be adapted only to cases of Amenorrhœa occurring in leucophlegmatic habits. This statement, if true, furnishes a strong argument against the true Emmenagogue power of these articles, because it is not in such cases, that a proper and mere Emmenagogue is to be relied-upon. Upon the whole there appears to me to be much ground for doubting that these articles are true and proper Emmenagogues; but still the subject should be thoroughly investigated.

At first view it may seem out of place to dwell so long upon a single article or two, in the proëm to a class. As it is however for the purpose of contributing to determine whether there is any real foundation for such class—whether there are any articles which truly possess the power on which such class is to be founded or not, I think what I have said will not be deemed too much.

The catamenial discharge is always a peculiar and specific secretion, with uniform and more or less definite characters. Whenever it deviates from these, it is morbid, and needs medical treatment. When it is morbid, it is very generally hemorrhagic. The catamenia constitute a periodical excretion, and having once appeared, they ordinarily recur in health only at regular and definite periods, whether such recurrence is spontaneous or factitious, i. e. the effect of medical treatment. If they are forced at any time except the normal one, the discharge is commonly he-

morrhagic, and not the regular and specific secretion. The catamenia are said to be retained whenever they fail of making their appearance either at or about the second climacteric period, and with proper maturity of the constitution; and they are said to be suppressed whenever they are suddenly arrested by some excess, deficiency or other irregularity of what are called the non-naturals, or the attack of some disease. They are likewise said to be suppressed, when, having once been established, they subsequently fail of recurring at the proper periods. Morbid derangement of the catamenia is idiopathic when it takes place suddenly and in health, in consequence of some excess, deficiency, or other irregularity of the non-naturals, or the access of some disease; and it is symptomatic when it is preceded and occasioned by some different specific disease.

Nothing in practical medicine is better known than that retention and suppression of the catamenia, whether the morbid condition is idiopathic or symptomatic, may not infrequently be obviated by other classes of remedies, beside what I should reckon as true and proper Emmenagogues, provided they are judiciously selected in relation to the true indications of the case. John Murray mentions four powers by which he supposes that Emmenagogy is some times produced. These are a Cathartic power, a Tonic power, a Stimulant power, and an Antispasmodic power. He says that "a Stimulant effect produced in neighboring parts seem to be in some degree propagated to the uterine vessels." "It is thus that some Cathartics, such as Aloë and Helleborus niger have been supposed to act, their Stimulus being communicated from the larger intestines to the uterus." "They are probably of advantage too in Amenorrhœa, simply as Cathartics, removing the state of torpor in the intestinal canal" (which is) "connected with the disease; and more advantage is derived from the Emmenagogues of this class, than from any of the others." (*J. Murr. Syst. Mat. Med. & Pharm. by J. B. Beek, fr. 4th Edinb. Edit. N. Y. 1828, Pg. 204.*) No Cathartic within my knowledge ever produces any true Stimulant i. e. Antisbestic effect; and certainly neither Aloë nor Helleborus niger ever does it. Besides, I do not think that true Stimulant i. e. Antisbestic effects are ever produced locally and much less in the intestinum rectum. It is an irritation merely and not true Stimulation which

here accomplishes the purpose; and may be and most commonly is merely local. But on this very point, practising physicians have often said to me, that this is a trifling and unimportant distinction not worth making; and these same gentlemen I have known depend upon mere irritants i. e. Oresthetics, where a quickly diffused increase of vital energy and strength of action was in fact required; and of course always with utter disappointment. Under this confusion with regard to true Stimulants i. e. Antisbestics, and mere irritants i. e. Oresthetics, I have often known decidedly exhausting Oresthetics employed when Antisbestics were needed. Under such a gross mistake, I have some times known the inference drawn than Stimulants i. e. Antisbestics were valueless; or that they had administered the article excessively and occasioned that chimera indirect debility. This distinction I hold to be of fundamental importance in practice.

But how are Cathartics of advantage in Amenorrhœa, except by producing a specific irritation referred to the lower and larger intestines? I have no knowledge that torpor of the lower and larger intestines as respects peristaltic action has any tendency to produce or perpetuate Amenorrhœa; and to what other torpor are these intestines subject? As I believe, to none at all. I doubt not that the Emmenagogue effect of Cathartics is always due to the specific irritation which they produce, except when they are pushed to an operation more or less drastic. Drastic and Hydragogue Catharsis is always more or less Adenagic, and Adenagics sometimes, if not often, operate upon the secretories of the uterus, as a part of their operation upon the secernent and absorbent or glandular system generally; and this brings to mind a power not mentioned by John Murray, which produces Emmenagogy not infrequently. When Amenorrhœa is symptomatic of exhaustion i. e. of debility generally, it would be injurious to restore the catamenia till a good degree of tone has been recovered. Here Cathartics and even Adenagics would be positively injurious, till the patient has been suitably invigorated; and when this is effected the catamenia will usually be restored spontaneously, or will readily return under the use of some appropriate Adenagic. These are the cases in which the Tonics and Antisbestics are so useful, indeed so important, so absolutely necessary. But in these cases, the Tonics and the Antisbestics can hardly be considered as even

indirect Emmenagogues since they only obviate the cause of the Amenorrhœa, without restoring the secretion. If the secretion returns, it does so spontaneously; and often an Adenagic is necessary to bring it back, even after tone is restored. The Tonics and Antisbestics are absolutely essential preparations, since without the restoration of the tone the restoration of the secretion would be highly injurious.

Exactly what John Murray intends by Antispasmodics, can be ascertained only by his catalogue of articles, since neither his definition, nor his proëm to the class, nor the intrinsic and etymological signification of its name throw much if any light upon the subject. I can not say what is, and what is not a remedy for some thing like Spasm, but which never the less is not Spasm, because I have no knowledge of any such diseases. I do not think that any thing which Murray reckons as a mere Antispasmodic is capable of operating either directly or indirectly to obviate either idiopathic or symptomatic Amenorrhœa.

Murray mentions Hydrargyrum (of course meaning certain of its preparations) as a Tonic, or as Tonics, which are capable of proving Emmenagogue. Now, if any of the Mercurials possess even the smallest degree of Tonic power, I have yet got it to learn. All of the Mercurials are more or less Adenagic, and as such, they are capable of obviating certain cases of Amenorrhœa which are by no means numerous. How Murray makes-out that the Mercurials are Tonics which are capable of proving Antispasmodic, is a mystery which I have never solved; and yet if they are not among his Antispasmodic-Emmenagogues I do not know what is. He certainly calls them Tonic-Antispasmodics. If I understand him aright, these preparations prove Antispasmodic by virtue of some peculiarity of their Tonic power; and they prove Emmenagogue by virtue of their Antispasmodic power. The correctness of all this however, depends upon the correctness of my supposition that the Mercurials are a part of his Antispasmodics, which he reckons as capable of proving Emmenagogue. The only other of Murray's Tonic-Antispasmodics, which I can possibly suppose that he reckons as Emmenagogue is Cinchona. This he certainly considers as a Tonic-Antispasmodic. I can not conjecture on what ground Murray reckons it an Antispasmodic, but I can easily perceive in what cases of Amenorrhœa it may

prove useful, viz. those which are intirely dependent upon exhaustion or general debility ; but its operation is according to the law of the operation of the Tonics, and in no other way, so far as I can discover. What any supposed Antispasmodic power can have to do with the matter, I am unable to conjecture. Of Cinchona in Amenorrhœa, I think we may say exactly the same as of every other efficient Tonic, with the exception only that it is perhaps preferable to every other, probably because the primary manifestations of its operation are in the sanguiferous system. In Murray's whole list of Antispasmodics, I can find nothing except the Mercurials and Cinchona, that any practical physician can possibly rely upon, either as a direct or indirect Emmenagogue. By the bye, what must be the foundation of a class that comprises Cinchona, the Mercurials, Opium, Cuprum, Common Æther, Sagapenum, Bitumen Petrelæum, etc., all of which are reckoned as Antispasmodics by Murray. I have seen the Adenagics oftener used for the production of Emmenagogy than any other class of agents. But it will be obvious (if my notions in regard to the Adenagics are correct,) that they must act upon the uterine secretion only as a part of a more general operation upon the whole secernent and absorbent or glandular system, and not as mere Emmenagogues.

Picrotoxic Acid or Picrotoxina, (for it is uncertain whether this substance is an Acid or an Alcaloid,) I have several times seen prove Emmenagogue in extraordinary circumstances. When employed for Neuralgia Rheumatalgica, (the patient, to all appearance, being in perfect health in all other respects, and never having had any derangement of the catamenial secretion,) I have repeatedly known Picrotoxic Acid or Picrotoxina produce the catamenia at various times between a week after their last recurrence, and a week previous to their regular return, and this after less than a week's use of the medicine. It may perhaps be thought surprising that after the repeated observation of such facts as the preceding, I have never yet employed this agent in Amenorrhœa of either sort; but the truth is, it is now so many years since I have been called to treat a case that did not require a restoration of tone, before a return of the catamenia could be desired, that I have had no opportunity to test its Emmenagogue power as it ought to be tested. In all of the cases to which I

have just referred, whenever I have succeeded in the restoration of tone, the catamenia have recurred spontaneously; and when I have not succeeded in such restoration, I did not desire the appearance of the catamenia. Although I can not reasonably doubt its Emmenagogue power, as a part merely of an Adenagic power, yet it requires to be further tested. Again I have assumed that it is Adenagic, but this also requires to be further tested. The fruit of *Anamirta paniculata* I very well know, and that from experience, to be Adenagic. But I have only inferred that Picrotoxic Acid is such, because the article which yields it is certainly Adenagic, and because it has proved Emmenagogue. But *Anamirta paniculata* contains another active principle, which I have never employed, and of whose powers I know nothing. For a more thorough knowledge of all the powers of each of these active principles, there ought to be an entirely new and complete investigation, and by a person who understands the diagnosis of both an Adenagic power and also of an Erethistic one, in contradistinction from a Narcotic one.

Polygala Senega and *Polygala grandiflorum* are well known as powerful Emmenagogues; but then they are such only as a part of an operation upon the whole secernent and absorbent or glandular system, and probably by means of the Hydragogue-Catharsis which they almost if not quite invariably produce, when used for the purpose now under consideration. These two species of *Polygala* are however ill adapted to the treatment of any cases of Amenorrhœa, whether of retention or suppression, that are attended with any material amount of exhaustion or general debility, because they are directly exhausting to a certain degree, though not sufficiently so to render them Antiphlogistic; because they almost always prove Hydragogue-Cathartic when used with even moderate efficiency; and because they impair appetite and digestive power, and leave the alimentary canal in an undesirable condition.

Sanguinaria vernalis, an Adenagic of considerable activity, I have often seen effectual for the production of Emmenagogy. This when properly managed never proves directly exhausting, nor is it ever Cathartic. Unless it should be so managed as to keep the patient Nauseated for the greater part of the time. I know of no way in which it can possibly prove injurious.

The same may be said of *Veratrum viride* that I have just said of *Sanguinaria vernalis*. Both are Erethistic, Adenagic and Emetic, with no other powers. Their Adenagic operation is sufficient to account for their Emmenagogue effects. It is quite probable however, that their Erethistic power increases their Emmenagogue operation. Unlike *Polygala Senega* and *Polygala grandiflorum*, they are destitute of all Cathartic power, while these last mentioned articles are destitute of any Erethistic power.

Lobelia inflata possesses the same powers by name, as *Sanguinaria vernalis* and *Veratrum viride*, though they differ considerably in quality. *Lobelia inflata* is Emmenagogue by virtue of its Adenagic power, and probably also by virtue of its Erethistic power, which by the bye, is less in proportion than in *Sanguinaria* or *Veratrum*. These will serve as specimens of some of the Adenagics which are employed for their Emmenagogue effects.

Cullen says that "writers on the materia medica, both ancient and modern, particularly the former, mention many medicines as Emmenagogues." He adds "I have employed a great number of these recommended by them, but I have been so very often disappointed of the wished-for effects, that I have ventured to allege that ancient writers had not, on this subject, spoken from experience." These disappointments which I have met-with, I find to have also happened to my fellow practitioners; and I have not, among the most experienced, found any one who does not acknowledge his failures in employing the Emmenagogue medicines recommended by writers; nor who does not own that he can not almost in any case of Amenorrhœa, with much confidence promise success in curing it." (*Cull. Treat. Mat. Med. B. S. Bart. Edit. Philad. 1812, Vol. II, Pg. 407.*) Cullen says that Emmenagogues are "a set of medicines the most unfaithful and very frequently disappointing our expectations from them." (*Ibidem.*) "What is the foundation of this failure" (says Cullen,) "it is not easy to assign; but I judge it to be owing to this, that we have not yet found-out a medicine which has any specific power in Stimulating the vessels of the Uterus." (*Ibidem.*)

I can not say that I have found as much difficulty in producing Emmenagogy as Cullen seems to have done. I have never yet become acquainted with any article that operates directly and

exclusively to increase the activity of the catamenial excretories of the uterus under all circumstances. I know however, a considerable number of Adenagics that increase the activity of the catamenial excretories as a part merely of an operation upon the secretant and absorbent or glandular system generally, though (as I think) not without reference to the condition of the system, under which they are employed. When the Amenorrhœa is produced by a morbid condition of the system at large, or by the existence of some specific disease, it is vain to expect a restoration of the catamenia; and even if they are restored under such circumstances, the restoration (I believe) always heightens disease in the aggregate and retards a cure. If I have carefully ascertained the general condition of the system accompanying the Amenorrhœa, and settled whether the case is idiopathic or symptomatic, and prescribed accordingly. I have uniformly found that as soon as the system is restored to its natural or healthy state, the catamenia have either returned spontaneously, or been easily produced, usually by certain Adenagics. If it would not be presumption for me to suggest such a thing of Cullen, I should surmise that his frequent failure in the production of Emmenagogy must have resulted from overlooking or neglecting some of the preceding considerations.

I have some times been called to prescribe for a case, in which the system has been deeply diseased, and in which the Amenorrhœa has been merely the effect of such disease. In these circumstances, I have been expected and occasionally even required to restore the catamenial secretion, without any time or opportunity to obviate the constitutional difficulty. This, as a general rule, has been impracticable, and when it has not, the recurrence of the catamenia under such circumstances, has but added to the difficulty in the aggregate. A compliance with such unreasonable expectations, even when it happens to be practicable, is very much to be deprecated, and happily can not often be done.

Let us attend a little further to Cullen's views and principles upon this subject, that we may obtain all the light possible upon the cause of his failure in the production of Emmenagogy. Cullen says, "I suppose the menstrual discharge to be upon the footing of an active Hemorrhagy; which by the laws of the economy is disposed to return after a certain interval, and which, after

some repetition, may, by the power of habit, be determined to return at regular intervals." (*Cull. Treat. Mat. Med. B. S. Bart. Edit. Philad. 1812, Vol. II, Pg. 407.*) Cullen says that as in all active Hemorrhagies, the flowing of blood depends especially upon the increased action of the vessels of the part, so in the uterine discharge, it depends upon an increased action in the vessels of the uterus." (*Ibidem.*) Cullen says that "the general doctrine" (of the Emmenagogues,) "amounts to this, that the medicines which are to be employed in both the states of Amenorrhœa," (viz. Retention and suppression,) "are chiefly those which strengthen and increase action of the vessels of the uterus." (*Ibidem, Pg. 408.*) What success should we expect in the production of an active i. e. entonic or phlogistic Hemorrhage, which requires agents to "strengthen and increase the action of the vessels of the uterus," the agents selected for this purpose being Castoreum, Assa-fœtida, Crocus, Ferrum, Aloë and Hydrargyrum, which constitute the whole catalogue of Emmenagogues in Cullen's materia medica? For myself, I never knew any thing accomplished in Amenorrhœa; either with Castoreum, Assa-fœtida, Crocus, or Ferrum. I am well aware that considerable importance is by many attached to Ferrum; but I repeat that I never saw the least benefit in Amenorrhœa from this agent alone, either under my own direction or that of any other physician. With Cantharis, Wine and Cinchona conjoined; or even with Aloë merely, when there was but moderate exhaustion, I have known it reckoned as performing wonders. If Ferrum were always to be employed unconjoined with any thing, I doubt not that it would sink greatly in the estimation of physicians, if it did not sink intirely out of the materia medica. Aloë is an Irritant-Cathartic under certain management; Hydrargyrum as an Adenagic often produces Emmenagogy; but when there is considerable exhaustion they often fail; and even when they succede, they commonly do injury rather than render benefit. I very much doubt whether any physician ever succeeded very well in the production of Emmenagogy, with such a meager, and (with two exceptions only) such a feeble list of Emmenagogues.

Stephenson and Churchill say "it is well known that the suppression" (and probably the retention) of this peculiar secretion," (viz. the catamenial) "is generally supposed to arise from defi-

ciency of action in the uterine vessels, which has led to the general practice of giving Tonics, or diffusible and permanent Stimuli," (*Steph. and Church. Med. Bot. Burn. Edit. Lond. 1836, Vol. III, Article 176.* "Deficiency of action in the uterine vessels" here doubtless has reference to atony; and since the change of the general diathesis of our diseases, which took place between 1805-6 or 7 and 1812, Amenorrhœa has been attended with such a "deficiency of action in the uterine vessels," and therefore it does require Tonics and Antisbestics. But in all cases of Amenorrhœa there is always a "deficiency of action in the uterine vessels" in an other sense of the phrase, viz. the sense of deficient activity, and this as well in nonatonic as in atonic cases; for formerly, under a different general diathesis, non-atonic cases were common. But it does not by any means follow that deficient secretory activity requires Tonics or Antisbestics. It is deficiency of vital energy and strength of action, and not deficiency of secretory activity, that indicate these two classes of medicines; for these two sorts of "deficiency of action in the uterine vessels" are materially and essentially different, however common it may be to confound them.

Deficiency of activity in the catamenial excretories of the uterus appears to me to be the very essence of Amenorrhœa of all sorts and kinds. This condition may exist alone, or it may be accompanied with other pathological conditions. The following are the principal combinations of different pathological conditions that occur in Amenorrhœa.

1. Deficient secretory activity (as is supposed by some) with a greater or less amount of entony. The existence of this combination is more than doubtful. I have inquired about it of many of those physicians who lived the greater part of their professional lives under the general phlogistic diathesis; but I never found any one who supposed that he had ever known such a case. As appears to me, the cases of Amenorrhœa that have been supposed to be entonic, must have been those in which a suspension of the catamenia, in the midst of their course, and in a woman of perfect health, has been suddenly produced by some great excess, deficiency or irregularity of some of the non-naturals, as for example, getting thoroughly wet to the skin, or becoming inordinately chilled during a protracted ride in extremely cold weather,

and with inadequate clothing, etc. Under these circumstances there is usually neither entony nor atony; but this is not always well understood. There is said commonly to be plethora, though the amount of blood in the system is no greater than it was before the suspension of the catamenia took place, and where there was certainly no degree or trace of plethora. There is commonly pain in the head and back; and some times there is flushed face, and some times a full and bounding, i. e. an irritated pulse. Such cases however, when occurring under a general phlogistic diathesis, differ considerably from the same cases occurring under a general atonic diathesis. But under both sorts of circumstances, they will tolerate almost any treatment, and health will return under it, the treatment, whatever it happens to be, acquiring great credit. I illustrate by such cases as I have seen. In short, I suppose the condition now under consideration is essentially the same as that which I am next to mention, viz.

2. Deficient secretory activity with a non-entonic and a non-atonic condition of the system.

3. Deficient secretory activity with a greater or less amount of atony.

4. Deficient secretory activity accompanied with an insusceptible, inirritable and torpid condition of the system at large.

5. Deficient secretory activity accompanied with a morbidly susceptible and irritable condition of the system at large.

6. Every combination of these several conditions that does not involve any pathological incompatibility.

7. Besides this there is Amenorrhœa existing in connection with every disease, by which it is capable of being produced symptomatically.

The loose and equivocal phrase "deficiency of action in the uterine vessels" seems to have been understood as vaguely as it has been expressed; and it constitutes one out of a multitude of cases in medicine, in which words have been made things, in which indefinite phraseology has been misunderstood and reasoned from in an incorrect manner, and (as would seem,) has led to great errors in practice.

I have long been in the habit of supposing that when the activity of an excretory is capable of being decidedly increased by one or more Adenagics; and much more especially when a con-

siderable number of articles of this last mentioned class produce this effect, we may expect with considerable confidence to find agents capable of acting directly and exclusively to increase the activity of such excretory, and this without any more general action upon the whole secernent and absorbent or glandular system, and without any increase or diminution of vital energy and strength of action in the vessels of the uterus. Upon this general ground, I have formerly expected that we should some day find Emmenagogues, when they are searched-for intelligently, i. e. with a discriminating knowledge of what constitutes an Emmenagogue in contradistinction from an Adenagic, or any other class of agents that is ever employed to produce this effect either directly or indirectly. As the uterus constitutes an integral part of the secernent and absorbent system generally, it will be obvious that its secreting function must be capable of being more or less affected by all those agents that operate upon the whole of that system, viz. by the Adenagics; but it will be equally obvious that the Adenagics can not be reckoned as true and proper Emmenagogues, any more than they can be reckoned as true and proper Diuretics, Diaphoretics, Blennagogues, etc. The Adenagics are all these, and more, at one and the same time; while a true and proper Emmenagogue should operate directly and exclusively upon the catamenial excretories of the uterus. But as the catamenial excretories of the uterus undoubtedly have some peculiarities of organization and susceptibility, in comparison with the rest of the secernent and absorbent system, I can discover no reason, a priori, why there should not be true and proper Emmenagogues, as well as true and proper Diuretics, or true and proper Diaphoretics; and I have long been of the opinion that, on proper research, such will actually be found. The catamenial excretories are so peculiar, and their excretion is so different from every other, that it would be strange indeed if agents should not be found, that are capable of acting directly, immediately and exclusively upon them, to increase their activity, without acting at all upon any other part of the secernent and absorbent or glandular system.

Not only practitioners of medicine, but writers on *materia medica*, have hitherto been in the habit of confounding in one promiscuous mass, those agents which operate directly and exclu-

sively upon an individual excretory merely; those which operate in the same manner upon the whole secernent and absorbent system; and those which operate only indirectly, and by virtue of totally different powers, either upon an individual excretory, or upon the whole glandular system. With such a perfect deficiency of discrimination, the wonder is that even true and proper Diuretics, and true and proper Diaphoretics should ever have been discovered, rather than that we should still be ignorant of any true and proper Emmenagogues, and any true and proper Blennagogues. Had no true and proper Diuretics ever been discovered, we should have no analogy in favor of the existence of any true and proper Emmenagogues, or any true and proper Blennagogues, and the conclusion would be much more probable that there is, in fact, no just foundation either for a class of Diuretics, Diaphoretics, Blennagogues or Emmenagogues, and that each of these excretions could be increased directly and immediately only by Adenagics or agents that act upon the whole secernent and absorbent system. This last opinion has indeed been advanced; but as appears to me, it has not been adequately substantiated. I am however, much more inclined to think that time and research will lead to a widely different conclusion, viz. that there are true and proper Emmenagogues, and Blennagogues, as well as true and proper Diaphoretics and Diuretics. From the peculiarities of organization and susceptibility (indicated by the peculiarities of the excretions) which the different secernents must inevitably possess, we should think that this ought to be the result (as I have said) of time and research. I must say however, that the longer I practice medicine the less has been my confidence in the force of this analogy.

In the present state of our knowledge and without any true and proper Emmenagogues, (unless *Chenopodium Vulvaria* and *Caryoxylon foetidum* are such) our means of obviating Amenorrhœa whether of Retention or Suppression are first directly by Adenagics, Cathartics and Ergastics; and second indirectly by whatever agents or classes of agents will relieve or obviate any pathological condition or disease of which the Amenorrhœa may be symptomatic. As I have stated elsewhere, I have found Adenagics very effectual for the relief of Amenorrhœa not symptomatic of any pathological condition or disease for which this class of agents is

not remedial, or is absolutely inappropriate. For such cases I have been in the habit of considering Adenagics as preferable to every other group of agents. However there is not much difference between the efficacy of certain Adenagics and certain Cathartics, in such cases. In particular instances, I have succeeded well with certain Ergastics, more especially Saltatio or Dancing, and Equitatio or Riding on Horseback. Itineratio or Journeying if properly conducted and continued for a sufficient length of time very often answers the desired purpose. Practically, or so far as their operative effects are concerned, each of these processes may be reckoned as active exercises, however authors may rank some of them.

The agents or classes of agents that are considered as proving indirectly Emmenagogue, i. e. which obviate Amenorrhœa by means of obviating some pathological condition or disease, of which the Amenorrhœa is symptomatic are (as is commonly supposed) First, Antiphlogistics; Second, Narcotics; Third, Oresthetics; Fourth, Antisbestics; and Fifth, Tonics. Pure idiopathic non-phlogistic and non-atonic Amenorrhœa may be readily distinguished from the several symptomatic sorts, by the circumstances that the patient is affected with no other disease; that between the regular catamenial periods, the general health does not deviate appreciably from its natural state; that at these periods, instead of the customary excretion or evacuation, there is more or less pain in the head, back, hips and legs, frequent micturition, flushed face, full and perhaps irritable and somewhat bounding but neither preternaturally strong nor preternaturally weak pulse, so that the patient is neither in an entonic condition on the one hand, nor an atonic one on the other. In true idiopathic non-phlogistic and non-atonic Amenorrhœa, the patient is commonly, but vaguely and indefinitely, said to be plethoric, though I imagine that it would be extremely difficult to show that the absolute quantity of blood in the system is at all preternaturally increased. At the catamenial period certainly, when the symptoms of the supposed plethora appear, the quantity of blood in the system is no greater than in the intervals, when no such symptoms exist. The truth is that by plethora in this application, those who use the term really understand phlogistic diathesis; though true phlogistic diathesis no more exists than the chimera plethora. So far as I

know, these are the only idiopathic cases of Amenorrhœa. Under the erroneous opinion that they are attended with a greater or less degree of atony, they are commonly treated by Depletion of Blood, Catharsis with the Antiphlogistic Salts; etc. This course, by virtue of the strong impression which it usually makes, is some times successful, without the aid of any other remedies; but much the most frequently it requires to be followed by other agents. The fact that invigorating agents such as Tonics and Antisbestics are of no service, but on the contrary are injurious before Bleeding and Catharsis, but are admissible afterwards, is true of every non-phlogistic and non-atonic disease, and in reality furnishes no evidence of the propriety of either of these sets of measures. A healthy man needs neither Antiphlogistics, nor Tonics and Antisbestics; but bleed and purge him enough, and the latter two will be admissible if not required. If by artificial processes a positive atony is produced when it did not previously exist, a contrary course will afterwards be admissible, though it was by no means indicated at first, any more than the exhausting measures. I have long been accustomed to see patients first bled and purged actively, and then stimulated (as the language was) efficiently; but I never yet met with any evidence of the propriety of contrary or opposite and medicinally incompatible measures in immediate succession, though I have heard many an argument (so called) and even some times from the chair of a professor, in favor of such a course. As appears to me, it is difficult to demonstrate the propriety or advantage (at least to the patient) of inducing a morbid condition not previously existing, for the sake merely of being able to employ the remedies appropriate to such condition.

In the treatment of true idiopathic Amenorrhœa of this sort, all that is necessary, in the present state of our knowledge in regard to Emmenagogues, is the efficient employment for a proper time of some appropriate Adenagic. Were there any true and proper Emmenagogues, these are the cases in which, as I think, they would be indicated. And yet these are not the cases in which *Chenopodium Vulvaria* and *Caroxylon foetidum* are alleged to be useful. I consider this as a strong argument against the supposition that these two articles are in fact true and proper Emmenagogues. But at the present period, and ever since the

change of the general diathesis of our diseases from entonic to atonic, scarcely any other cases of Amenorrhœa, except those which are purely and exclusively symptomatic, seem to occur. Amenorrhœa in fact much the most frequently depends upon various morbid conditions of the whole body constituting other specific diseases. However a mere and pure reduction of the vital energies considerably below the range of health, is very frequently attended with a cessation of the catamenia. In all these symptomatic cases, the suspension of the uterine excretion seems to be a salutary provision intended to retard the progress and lessen the degree of the exhaustion, which would otherwise take place. In such cases, matrons and nurses, and much too often physicians are liable to attach very much too great importance to the single symptom of suspended catamenia, and consequently to direct the principal part, and some times the whole of their efforts to the obviation of this symptom merely, while the primary disease is suffered to progress unheeded and unremedied, and perhaps aggravated by the use of injudicious medicines for the Amenorrhœa merely. Under such a course, very happily there is a total failure of success in the restoration of the uterine excretion, which would be much more fortunate for the patient, were it not for the fact that it gives rise to a vain and injurious perseverance in remedies highly improper for the case.

It would be difficult to enumerate all the various diseases of which Amenorrhœa may be, and often is symptomatic; and such an enumeration is not at all necessary. Mere symptomatic Amenorrhœa is always to be removed by the removal of the disease of which it is a symptom, or of which it is a consequence. The remedies must of course be as various as the diseases require which occasion the Amenorrhœa. A specification of the different pathological conditions with which Amenorrhœa may be, and often is connected, or on which it may be dependent, would answer every practical purpose, and might therefore be useful. This would be easy to make, but I shall omit it for the purpose of retrenchment.

The synonymy of this class is less than that of any other, it being only *Emmenagoga*, *Menagoga*, *Uterina*.

It will at once be perceived that *Menagoga* is precisely the same term as *Emmenagoga*, the prefixed preposition only being dropped.

The term *Uterina* is a mere Latin attribute with the signification of *relating to the uterus*. It is often applied to every thing supposed to exert any influence whatever upon the uterus; but it is now commonly confined to the Emmenagogues. It is objectionable from the vagueness of its signification; but it is inadmissible because it is Latin.

PROËM TO THE CLASS ECBOLICA.

There is an ancient and classical Greek verb signifying *essentially to cast-off; to produce abortion or miscarriage; to occasion parturition*; from which the term Ecbolica is regularly and legitimately derived. This term has been long in use; but whether it was employed by the ancient Greek physicians or not, I am now ignorant, and have not at present leisure to ascertain. A belief in the existence of Ecbolics is certainly quite ancient, how much so, I am unable to say. Ecblexis and Ecbolē are both legitimate nouns-substantive derived from the same verb from which Ecbolica is formed. Both of these terms denote *a casting-off; an abortion or miscarriage; and parturition*. I consider Ecblexis as a term much preferable to Ecbolē, though the latter is found in all the common Lexica, which is not the fact with the former. As I have been informed, the term Ecblexis is in use among the modern Greeks.

There is another classical Greek verb signifying *to cause abortion or miscarriage; or to produce parturition*; from which the term Ectitrotica is regularly and legitimately formed. I believe that this term is not found in the common Greek Lexica; but it is in common use in Europe. Ectitrosis is a regularly formed noun-substantive from the same verb from which Ectitrotica is derived. Of course it signifies *abortion, miscarriage and parturition*.

From a combination of a Greek attribute for *sharp or sour*; and a Greek verb signifying *to bring-forth*; or *to produce by parturition*; is formed the term Oxytocica, i. e. *sharpeners of parturition*; a term principally employed by the French. Oxytocia is an ancient classical Greek term having exactly the same import as Oxytocica. Oxytocos would be a regular Greek noun-substantive denoting *parturition* produced by an Oxytocic; since *tocos* denotes *spontaneous parturition*; "*ipse pariendi actus*;" but I do not at all like this term. As appears to me, Oxytocecis would be equally legitimate and in other respects more eligible. Indeed if the Greek letter commonly represented by the Roman or Latin *c* were to be represented by *k* making Oxytokesis the sound of the term would be much improved. I mention these three terms as names of this class, because all of them are employed with about equal frequency. For myself, I greatly prefer the term Ecbolica, and next to this the term Ectitrotica; but a different preference is entertained by many. The first two certainly are equally appropriate.

As I have already mentioned three of the names of this class, I may as well finish the synonymy in this place. There is a Greek noun-substantive of the feminine gender, with both a singular and plural number which signifies *partus*; *puerperium*; *the bringing-forth of a child*; *child-birth*; etc. (See *Hedericus's and Donnegan's Lexica*.) There is likewise another term spelled in the same manner; but with a different accent, which is of the neuter gender, plural number, and without a singular, and of course declined differently. This signifies *purgamenta post partum in mulieribus relictæ*. From the first of these terms *lochica* would be a legitimate derivative attribute signifying *Parturificientia*, as correct a name for this class as Oxytocica, Ectitrotica or Ebolica. As respects signification and its being a single word I perceive no objection to it; but the fact that it is pure Latin is sufficient to cause its rejection.

This class has been called *Parturificientia*. As respects signification and its being a single word, I perceive no objection to this name; but the fact that it is pure Latin is sufficient to cause its rejection.

The term *Abortefactiva* and *Abortefactores* I have often heard applied to this class; but their import is too limited, and they are

pure Latin. The class has been called *Abortefacientia*.

This term has a too limited signification and is Latin. These two circumstances are sufficient to determine its rejection. It is not however objectionable, like the next two terms, on the score of its consisting of two distinct words, which can not be compounded into one.

The class is often called *Partus-acceleratores* and *Partus-acelerantia*. These compound names are appropriate enough in respects their signification, for it can not be expected that a mere name should imply an exact and complete definition. The fact however that both consists of two words, which can not well be combined, constitutes a serious objection to them; and the additional fact that they are pure Latin, contrary to the law of nomenclature for the classes, absolutely excludes them.

This class has been considered as identical with the supposed *Emmenagoga*, and under that view has had the term applied to it. But it will at once be obvious that there must be a material difference between that power which operates directly and exclusively to produce contractions of the muscular fibers of the gravid uterus, and that power which operates directly and exclusively to increase activity of the catamenial excretories of the same organ. But it may be said that, as there are no true and proper Emmenagogues, and as Emmenagogy is always produced by some other power beside that of a true and proper Emmenagogue, this group of agents may be one of the sets of articles that sometimes operates in this manner. This however brings us to the question by what power these agents are supposed to prove Emmenagogue; for every agent used for this purpose has some power, which is the foundation of another class. The power of directly producing contractions in the muscular fibres of the gravid uterus is not the foundation of any other class except indeed Ecbolics; nor will such a power produce Emmenagogy. It appears clear to me therefore that Ecbolics are widely different from Emmenagogues, and from every agent ever used as such.

Definition. True and proper Ecbolics, Ectitrotics or Oxytotics (if there are any such agents) are articles which act directly and exclusively upon the gravid uterus, contributing to produce, or actually producing parturient contractions when they did not previously exist, and increasing them when already begun, and

this without increase or diminution of vital energy and strength of action in any other subordinate part of the system, and without being preceded or occasioned by any other operation. If the uterine contractions in a given case, are produced by a power which is the foundation of another class, the article producing them can not be considered as a true and proper Ecboic. All this, as appears to me, is necessary to constitute a true and proper Ecboic. When any agent has the power of proving truly and properly Ecboic, it will be obvious that it must have the power of acting especially upon that part of the involuntary motor nerve of chemical action, nutrition and reproduction which is sent to the uterus. The essence of an Ecboic operation consists in the production of peculiar contractions of the muscular fibres of the gravid uterus, which may generally be distinguished from the natural contractions, by their being much more nearly continuous, or at most merely remittent and not intermittent, like those which are natural.

But are there any true and proper Ecboics according to my definition? I never could actually satisfy myself that there are. In fact, all positive evidence seems to me to be against it. If there is such a class of agents, would not its proper place in my system be in the first nexus, alliance or group of classes, immediately after the Erethistics and between them and the Euphrenics? Admitting this class to be demonstrably spurious, this subject might still merit consideration. Considering the class Ecbolica however as more or less doubtful, or at least as requiring further investigation, I have been in the habit of locating it immediately after Emmenagoga and Blennagoga, classes equally doubtful, but which I have often supposed might yet be discovered, though perhaps Ecboics may not agree with the character of the nexus or alliance. As a public instructor I was always expected, in fact required to treat of the spurious classes Antidota, Anthelmintica and Antilithica, which I did by way of appendix to the proëms of the true and genuine classes. With these might be associated all that it would be necessary to say of the Ecboics. Upon the whole I entertain great doubts whether the Ecboics (at present so called) deserve to constitute a distinct class in the materia medica; or in other words, I doubt whether there is an Ecboic power now known distinct from other powers,

which constitute the foundation of other classes. It appears to me to be highly probable, for reasons soon to be given, that all the most efficient and truly important articles now reckoned as Ecboïics produce their Ecboïic effect by virtue either of a Narcotic or an Erethistic power, one or the other; but of the correctness of this opinion I would not be understood as being absolutely sure. What is to follow will exhibit the ground of my doubts and uncertainty.

CLAVICEPS PURPUREA.

Claviceps purpurea (Ergot of Wheat, Rye, etc.) may be taken as an example of a Narcotic which may be made to prove Ecboïic; and the inquiry may be made whether it proves Ecboïic by a true and proper Ecboïic power as I define it, or by its Narcotic power. Claviceps is generally believed to have the power of acting directly upon the muscular fibers of the uterus, producing contractions when they were not previously occurring, or increasing them when they previously existed. From this supposed or real power (as the facts may happen to be) it is believed by some, that this agent is capable of acting in a similar manner upon the urinary bladder, when it is affected with what is called (I believe erroneously) Paralysis, much more likely Acinesia a distinct pathological condition. Now the muscular fibers of the uterus are involuntary and intended to act only when this organ is impregnated, while the muscular fibers of the urinary bladder are voluntary and intended to act at any time in obedience to the will. Such a great difference in the functions of the two organs, and of the subordinate parts of the nervous system involved, as well as the fact that one is operated-upon only in health and the other only in disease, we should naturally expect might occasion a great difference in their susceptibilities, as well as the manner in which they are affected by medicine. It would indeed be a very important fact, if it were well ascertained, that Claviceps should be capable of producing an Ecbleisis of the accumulated urine from a urinary bladder in a state of Acinesia, as well as an Ecbleisis of the fœtus from a gravid uterus at the full time of parturition. The two processes seem very little alike; and a priori would hardly be expected to be accomplished by the same power and operation; but I have nothing except a negative experience to oppose to the positive testimony which there is of it. But with-

out any reference to this hypothesis, we find published statements that, as a matter of experience, Claviceps is more or less effectual for relief of what is commonly called Paralysis, doubtless *Acinesia Vesicæ urinariæ*. If this article really has the power of relieving this affection, I should think that it must have some other medicinal power beside those of a Narcotic and Ecbotic, as I understand these powers.

Claviceps purpurea most certainly possesses a very decided Narcotic power, since it is capable of all the several grades or degrees of a Narcotic operation, with about as many, and as prominent peculiarities to be sure, as commonly distinguish the different individual Narcotics from each other. It is most decidedly Antirritant, and I think also that it is Anodyne, though I have never relied upon it alone, for the relief of any case of severe pain, simply because I never felt justified in trusting to an article with which I had so little experience, in cases where the patient is the subject of so much suffering. At all events, where this article has been employed freely as an Anodyne, very little Papaver has seemed to be necessary in proportion to the apparent severity and intensity of the pain. I have often witnessed a Hypnotic or Soporific effect from this agent; and in two cases where I thought it had been given inordinately, it produced a degree of Coma that was thought dangerous for a considerable time. I have also seen most of the other symptoms of Ultimate Narcosis in a very decided degree from this agent. I very well know a medical gentleman who was formerly much in the habit of using this article for its Narcotic effects merely, esteeming it more like Papaver than any other article in the *materia medica*. Whether he continues this practice to the present time I am unable to say.

I have heard a Narcotic power denied to this article, but I have often witnessed every regular grade of the operation of this power in both sexes. If it should be deemed an objection to this statement that Claviceps is represented, when given in large doses, as producing Spastic or Convulsive action before it has produced any other noticeable Narcotic effects, I answer that, in like manner, *Botrophis Actæoides* and *Strychnos Nux-vomica*, when given in large doses, produce Spastic or Convulsive action before they produce any other noticeable Erethistic effects; and why should

this thing be more incredible in one case, than in the other? It can be shown conclusively that a certain group of Narcotics have the power of producing Spastic or Convulsive action, as a primary part of their operation, provided they are given in sufficiently large doses at once, and that such Spastic or Convulsive action occurs in certain involuntary muscles, before it is perceived in the voluntary ones. As I have elsewhere stated, there are three prominent sorts of Spasm or Convulsion producible by medicinal agents, two of which are occasioned by Narcotics, viz. clonic and subtonic Spasms. Perfectly tonic Spasms, so far as I have ever been able to ascertain, are producible only by Erethistics. No individual Narcotic or Erethistic ever produces more than one sort of Spasm, but every article of these two classes is always true to one sort. There are other less prominently distinct sorts, but, so far as I know, none of them are producible by any medicinal agents.

Like other Narcotics, Claviceps has the power of producing Spasms or Convulsions of the most common, i. e. the subtonic sort; and if given freely within a short time, it produces these as one of the primary parts of its operation; and it produces them in involuntary muscles before it occasions them in the voluntary. When I have known this article given very freely as a Narcotic, and in women not gravid, they have usually complained much of what they denominated painful and distressing "Cramps" in the region of the uterus, which other physicians have unhesitatingly pronounced to be unequivocal Spasms of the uterus. Of this I am not quite as well satisfied as the gentlemen in question appeared to be. But what were they if not Spasms? Possibly they may have been a peculiar sort of Neuralgic pains. I should myself be inclined to consider them as Spasms if I could consider the unimpregnated and perfectly contracted uterus as capable of being affected with Spasms. In an impregnated uterus, at least one that had been gravid a few months, I doubt not that the effect of Claviceps would have been uterine contractions, whether Spastic or not, will soon be considered. Now these "Cramps" so called, appear to be the nearest approach to Spasms of which the unimpregnated uterus is capable.

Next to this I have seen greatly disturbed action of the heart

produced by what I considered an inordinate quantity of Claviceps. This affection it is not easy to describe. Those physicians that I have been with when it occurred, called it "tumultuous action" and seemed to be perfectly satisfied that they should be well understood. I have seen a much higher degree of a very similar effect produced by Botrophis Actæoides, which I shall soon mention again. The effects in question were undoubtedly produced by Claviceps, in consequence of the administration of an inordinate quantity of an unusually strong preparation of a better article than common to a very susceptible subject by an attendant under strong apprehensions. I have seen the effects which I describe several times and always under the same circumstances, so that I feel sure that they are not accidental.

As appears to me, when any thing like strong uterine contractions are produced by Claviceps, they are always decidedly Spastic or Convulsive, since they exhibit all the usual and essential symptoms of Spasm or Convulsion, and since when pushed beyond the production of strong uterine action, this article often produces very nearly universal Spasm or Convulsion very much of the same character as the previous affection of the uterus. I have twice seen the whole body rendered rigid in this way, and attended with only slight remissions. In these cases however, there was nothing like an Opisthotonos. Emprosthotonos and Pleurosthotonos, without a sufficient irritation confined to the origins of particular nerves of voluntary motion, but not affecting the whole, appear to me to be incapable of occurring, so that I need not say that they are doubtless never producible either by Narcotics or Erethistics, the only medicinal agents ever capable of producing Spasms or Convulsions. I have commonly been in the habit of defining Spasm or Convulsion as an abnormal, sudden and more or less violent, but brief contraction of one or more muscles or bundles of muscular fibres. The uterine contractions in natural and regular parturition, are certainly very like tonic Spasms; but as parturition is certainly a natural process, and therefore a process of health, it can not well be considered as Spastic or Convulsive, unless we extend the definition beyond what is morbid. If the word *abnormal* were omitted from this definition, I can not discover why it would not be perfectly ap-

plicable to regular and natural parturition, without comprehending any thing else which is not truly abnormal or morbid, or in other words, which is not unequivocal disease. But there is an obvious difference between natural parturient contractions and those produced by Claviceps; and I will anticipate so much as to add by Botrophis Actæoïdes. As I have seen uterine contractions produced by these two agents, they may always be easily distinguished from those which are natural. With this definition and explanations, I leave it to others either to make a new definition of Spasm or Convulsion, or to accept mine either with or without the qualifying term *abnormal*, and of course to rank natural parturition accordingly.

Claviceps purpurea is likewise Ecbotic; but whether it is such by virtue of its Narcotic power merely, or by virtue of a different and distinct power, viz. a true and proper Ecbotic power, as according to my definition, I do not pretend to decide. I only furnish considerations that may contribute toward a correct decision. It appears to me certain that the uterine contractions it produces are decidedly of a Spastic or Convulsive nature, because they exhibit all the usual characteristics of Spasm or Convulsion; because if it is pushed considerably beyond the production of mere uterine contractions, it is certainly capable of producing nearly universal Spasms or Convulsions—Spasms or Convulsions of the same general character as the normal contractions of the uterus, and Spasms or Convulsions of which the uterine contractions in question are but the beginning. Never the less, as I have already inculcated, the factitious contractions produced by Claviceps, if decided, may be readily distinguished from spontaneous and normal ones. What circumstances are there then, which indicate that the Ecbotic effects of this agent are any thing else than the regular Spastic or Convulsive action which the Claviceps as a Narcotic, must necessarily have the power of producing? I know of none, except the fact that they are much more readily produced in the gravid uterus than in an unimpregnated one (of which the reason appears to me to be sufficiently obvious) and except that the whole system is far more readily affected with these Spasms or Convulsions by this agent, when the subject is gravid than when not.

Does not the fact that Claviceps produces subtonic Spasms or

Convulsions, as one of the primary parts of its operation; and in involuntary muscles in preference to the voluntary, explain its Ecbolic operation without any necessity of its possessing a true and proper Ecbolic power, as according to my definition? Would not any Narcotic operating in this manner in the same degree necessarily prove equally Ecbolic, if given freely enough within a sufficiently short time? If this agent does actually prove Ecbolic merely by virtue of its Narcotic power, which is the foundation of an other class, it can not of course be admitted to be a true and proper Ecbolic. If then Claviceps is in fact a Narcotic (of which there are positive proofs) and if the uterine contractions which it produces are of a Spastic or Convulsive character (which as appears to me, cannot be disproved) it would seem that we cannot well avoid the conclusion that the uterine contractions in question are occasioned intirely by its Narcotic powers. But if this is the fact, why are not all Narcotics that are capable of producing Spastic or Convulsive action as a primary part of their operation, equally efficient as Ecbolics as Claviceps? The laws or principles in relation to this point, seem to be the following, viz. First. Some Narcotics produce Spastic or Convulsive action as a primary part of their operation, when they are taken in single, full or large doses; while others produce it only as a part of their ultimate Narcotic effects. Second. Some Narcotics produce Spastic or Convulsive action first in the involuntary muscles; while others produce it first in the voluntary. Third. Some Narcotics produce Spasms or Convulsions of the common or subtonic sort, while others produce them of the clonic or Epileptic sort. Now it would seem that all those Narcotics which produce Spastic or Convulsive action as a primary part of their operation, when they are taken in single full or large doses; which produce Spastic or Convulsive action first in the involuntary muscles; and which produce Spasms or Convulsions of the common or subtonic sort, should all be Ecbolics, at least when there is any predisposition to uterine contractions, and generally when there is none.

There is a peculiarity in the operation of Claviceps, which is here worthy of notice, because, as I think, it is certainly due to its Narcotic operation, if no other of its effects are. I here allude to the fact that when the influence of a sufficient dose passes-off

before the birth of the child, the susceptibility to its subsequent influence is very materially diminished, till there has been time for its secondary as well as primary effects to disappear wholly. In addition to this, Claviceps is very liable to Narcotize the child, and even to destroy its life by this operation. It is surprising that any one who has ever witnessed the Ultimate-Narcotic effects of Papaver, or any other article of this class that has the power of producing Coma, should fail of recognizing the true character of this symptom, and all the others which accompany it. I have repeatedly seen this Ultimate-Narcosis from Claviceps, when it has been given largely to very susceptible adults for Hemorrhagia, Dyspnœa exacerbans, etc. Again, it is equally surprising that any one who has practiced obstetrics for any considerable time, should suppose that a child has been squeezed to death, which is born flaccid, limsy or limber, livid, and with utter incapability of spontaneous respiration for any length of time, and this three fourths of an hour after the taking of a full dose of Claviceps by the mother for a cessation of uterine contractions when there was ample relaxation of all the soft parts at the time of the cessation. I have known cases in which the pelvis of the mother was very small, and the head of the child very large, where strong parturient contractions continued three and four days, so that, at the birth, the head of the child was extremely compressed and elongated; and yet as soon as it had passed the soft parts, the child cried lustily, and exhibited other signs of activity. In fact I never witnessed any thing like Coma, any livor, any flaccidity, or any difficulty in keeping-up respiration in the child from the strongest and the longest compression of the head in the most protracted parturition.

If Claviceps proves Ecbotic merely by virtue of its Narcotic power, we may say that this is the sole power which it possesses. But if its Ecbotic effect is independent of its Narcotic power, I think we shall be obliged to consider it as a true and proper Ecbotic, as according to my definition, and then we must reckon it as both Narcotic and Ecbotic. I do not think that it can be considered as possessing any other different and distinct power. If it is a mere Narcotic, perhaps its Ecbotic effects are a part of a Narcotic Erethism. Now I wish it to be expressly understood that I do not profess to have knowledge enough of the whole

operation and effects of this agent to be able to decide whether it is a true and proper Ecboic or not, and whether it proves Ecboic merely by certain peculiarities of its Narcotic power or not.

There are said to be three species of *Claviceps*, all of which probably possess the same medicinal powers, and if so, doubtless operate in the same manner, whether they are less or more active than the most common species. The two additional ones are *Claviceps microcephala*. (*Tulasne*) and *Claviceps nigricans*. (*Tulasne*.) I must not be understood as stating that these two have actually been ascertained to be medicinal i. e. Ecboic. I only state that it is probable, from their natural-history affinity.

Beside these, I have good reason to believe that there are other Fungi, not improbably a considerable number, that are capable of operating in the same manner, and of producing the same effects.

*SCLEROTIUM ZEÏNUM. (Bonafous.)**

Ergot of Maize. (Roulin.)

**Maïs peladero. (Incolarum.)*

This is said to be much more active as an Ecboic than *Claviceps purpurea*, beside producing other very singular effects upon the animal economy, if it is used protractedly. "The Ergot of Maize, according to Roulin, is very common in Columbia." "Its use," (long protracted of course) "is attended with the shedding of the hair, both of man and beast, and" (sometimes) "even of the teeth." "Mules fed on it lose their hoofs, and Fowls lay eggs without a shell." "Its action upon the uterus is as powerful as that of Ergot of Rye, and perhaps more so." (*Ann des S.* 19, 279, and *Lindl. Introd. Nat. Syst. Bot. Lond.* 1830, *Gramin. Pg.* 303 and 304, and *N. Y. Edit.* 1831, *Pg.* 301, and *2d Edit. Lond.* 1836, *Gramin. Pg.* 378.) I do not by any means know that *Sclerotium Zeinum* is Narcotic; but it is so like *Claviceps purpurea* in its ecboic power that we may well presume it to be like it in its Narcotic power, so that doubtless the same reasoning

*It is to be observed that *Sclerotium* is now considered to be a spurious genus, but as I do not know how the several articles have been disposed-of, that were once supposed to be its species, I am obliged to designate this agent by an exploded and incorrect name; but one which will never the less serve to identify this particular Fungus. (See Bonafous *Hist. Nat. Agric. et. Econom du Maïs Paris*, 1836, 1 Vol. *Fol.* 19, *planches colorées.*)

in regard to the *modus operandi* will be applicable to both. It is doubtless by its Abortifacient power that it causes the eggs of Fowls to be extruded before there has been time for a shell to be formed. By what power does it cause the shedding of the hair of man and of brute animals, and the casting-off of the hoofs of Mules long fed upon it? As it is scarcely probable that it is necessary to understand this, in order to understand its Ecboic power, I think that this subject may very well be postponed till the individual article is fully treated of. I will only add in this place, that these effects must either be due to some peculiarity of its Narcotic power, which is the more probable opinion, or it must possess a very powerful degree of Adenagic power, which is the less probable opinion. It must not be forgot that quite as extraordinary effects are imputed to Clavicéps, viz. the production of Gangræna Ustilaginea. If this imputation is correct, it assimilates the two articles very closely. Great care however is necessary not to confound mere speculations with positively proved facts.

SCLEROTIUM MAYDIS. (*Dub.*)

An article that has been described under the name of Sclerotium Maydis. (*Dub.*) and supposed by some to be Roulin's Ergot of Maize, but perhaps erroneously, is reputed to be active in the same way. As I know nothing of the natural-history characters of Sclerotium Zeinum. (*Bonafous*) or of Sclerotium Maydis. (*Dub.*) I would suggest the inquiry whether these two names are really synonyms belonging to the same Fungus?

SPERMÆDIA MAYDIS. (*Fries.*)

This has also been supposed to be Roulin's Ergot of Maize. This seems to be Lindley's opinion. If so it is probably a synonym of Sclerotium Zeinum. (*Bonafous*) or Sclerotium Maydis. (*Dub.*) or both. This suggestion however may possibly seem very absurd to one acquainted with the characters of the whole three articles, or perhaps one or two articles, as the case may happen to be. But SpERMÆdia is now considered a spurious genus. Whatever this may rightly be, it is said to be active. (*See Lind. Flor. Med. Lond. 1838, p. 624.*)

UREDØ MAYDIS. (*De Cand.*)

Uredo Maydis. (*De Cand.*) is said to be active like Claviceps purpurea; but I know nothing about it.

There are doubtless many more active Fungi than are now known.

BOVISTA NIGRESCENS. (*Persoon.*)

A distinguished physician of my acquaintance informed me, about the year 1810, or at the time that the *Claviceps* began to be revived as an Ecbotic, that Puff-ball, i. e., *Bovista nigrescens*. (*Persoon*) or as he said, *Lycoperdon Bovista*. (*Linnæus*) collected before the interior becomes a powder, is a Narcotic and Ecbotic, and he doubted not that Ergot would prove to be Narcotic as well as Ecbotic; and he added that he believed from analogy that many other Fungi would be found to have the same powers. As he was correct in one part of his statement, the rest merited investigation.

BOTROPHIS.

But there are other groups of articles capable of proving Ecbotic—often actively so, and yet without any degree of Narcotic power, as I view their operation, though esteemed Narcotic by some. Of these, *Botrophis Actæoides* may be taken as a type. I have elsewhere endeavored to show that the principal power of this agent is what I call Erethistic. Without specifying all of its effects belonging to the medicinal grade of its Erethistic operation, it is important to state here that it increases susceptibility when there is torpor or prostration, and that it contributes to obviate Somnolency and Coma, rather than to produce them. I have been in the habit of employing *Botrophis* for various purposes, ever since I commenced the practice of medicine, in 1811; and though in deference to the then universal usage of all those acquainted with it (for it has long been known and employed in Connecticut, and I venture to say, elsewhere in New England) I long called it Narcotic, though I never believed it to be such, since, according to all my observations, it never proves directly Antirritant, Anodyne, Hypnotic or Soporific; and without the power of producing any of these effects, according to my views, no article can properly be reckoned a Narcotic. How then does this article prove Ecbotic? Is it a true and proper article of this class, in conformity with my definition, or does it operate in some other way?

By those who have read the proëm to the class Erethistica, it will be recollected that several turmæ of the very active

modern genera *Cimicifuga*, *Botrophis* and *Actæa* are very closely allied to each other in external sensible properties, and also in occult and medicinal ones; and so I suppose is *Trautvetteria*. But of this genus I have no personal knowledge. The two species are represented as being most nearly allied to *Cimicifuga*. It would be quite extraordinary if no other of the *Erethistics* should be found to be capable of operating as *Ecbolics*; but at present I have no certain knowledge of any other.

RUTA GRAVEOLENS. (*Linn.*)

Certain *Rutaceæ* have long been known to be capable of producing the operative effects which I consider as indicative of an *Erethistic* power, and have likewise been generally reputed to be *Ecbo*lic, time immemorial. *Ruta graveolens* is one of these. It is certainly *Erethistic* and *Ecbo*lic, besides possessing several other powers. Numerous cases are on record of its producing abortion and miscarriage, both in ancient and in modern times. I have now before me references to a number of these, which I shall omit till I come to a more appropriate place for them. I will only add here that, to all appearance, they rest on good authority.

DICTAMNUS FRAXINELLA.

This is another *Rutaceous* species which is supposed by some to derive its generic name from a Greek verb signifying *pario*, i. e., to bring forth by parturition; or, to use another term, *parturio*. There is abundant testimony that this article is *Erethistic*, and as in the case of *Ruta*, it has been considered, time immemorial, as *Ecbo*lic, i. e., capable of producing abortion and miscarriage. This article possesses several other powers.

LOBELIA INFLATA, SANGUINARIA VERNALIS AND VERATRUM.

Lobelia inflata and *Sanguinaria vernalis* are reported to have proved Abortifacient when used freely and for a considerable time, without doubt by their *Adenagic* power, though possibly assisted by their *Erethistic* power; but this latter may perhaps be doubtful. If *Sanguinaria vernalis* ever produces this effect, doubtless *Veratrum viride* is capable of doing it likewise, since it is so much like *Sanguinaria* in its operation and effects, though I never heard of a case. I have myself known abortion and miscarriage to follow a free use of the former two, but it might admit

of a question whether these effects were produced by the medicine or the disease.

TANACETUM.

There is a widely prevalent opinion in some parts of New England and of the Middle States, that *Tanacetum vulgare*. (*Linn.*) is an effectual Ecboic. This article contains a bitter principle, by means of which it is a Tonic of considerable activity, and likewise an essential oil by means of which it is Euphrenic (or possibly Erethistic, more likely the former,) and Narcotic, unless an Erethistic can produce clonic Spasms. When taken in a large quantity, this essential oil produces true Epileptic Convulsions, and not infrequently death. I have myself known this catastrophe several times, and oftener Epileptic Convulsions, from which there was recovery when it had been taken to produce abortion. With the exception of its Tonic effect, the powers and operations of this article are much like Nutmeg and Camphor, both of which are Euphrenic and Narcotic, and I doubt not Antisbestic and Diaphoretic and capable of producing Epileptic Convulsions. Where I have lived and practised my profession, whether within New-England or out of it, no article, not even *Claviceps* itself, has the popular confidence as an Ecboic, to such an extent as some preparations of *Tanacetum*. I have very often heard rumors of its successful use as an Abortifacient, but of course, such cases rarely fall within the cognizance of the well educated and upright accoucheur, unless so much happens to be taken as to occasion severe clonic Spasms. I can not say that I have any knowledge, derived from observation or experience, of the Ecboic operation of this agent. It is true that in lingering parturition under my charge, when the patient and the women assistants very much desired it, I have suffered or permitted its use; but as was always alleged, quite too timidly. However, when it has been used, and with the greatest freedom, I have often thought that it did actually increase more or less the activity of the parturient process, but of this it was difficult to be absolutely sure. When I have been in attendance, I have never suffered it to be employed, except in the form of warm Infusion, and always of the recent plant instead of the dry, whenever it could be obtained, though never in anything like a large quantity, since I was always determined to avoid Convulsions. Perhaps all the Ecboic effect that it

seemed to produce might have been the effect of the hot menstruum. In a large proportion of all the cases in which there is reason to think that Abortion is attempted (and I fear that this is not uncommon even with married women) it is believed to be done with Tanacetum. If it were not often successful, it seems to me that it would lose its reputation. But perhaps I am mistaken as respects the frequency of its use for this purpose. It is a very common thing in some large towns for some vagabond-like boy to apply at the shops of the Apothecaries for "ninepence worth of Spurred-Rye," as their language is. If questioned as to the use to which it is to be applied, they generally know nothing about it, nor can they tell who wants it. They are simply employed for the errand of buying it. Sometimes, but rarely, they will give you to understand that it is to be used in the form of much sweetened Infusion, for the purpose of stupefying the common House-Fly, in order to be able to sweep them into the fire. I have certainly known it used for this purpose, but according to my belief it is far oftener used for a widely different one, though with what results I have no knowledge. It is possible that this article may prove Ecβολic by means of some aggregate of its acknowledged powers, without being a true and proper Ecβολic according to my definition; and as it produces clonic Spasms instead of sub-tonic ones, this is exceedingly probable. This is an old and an active article of the *materia medica*; but nevertheless it requires thorough investigation much more than many articles which have been recently introduced.

Thus far all the articles which I have mentioned are either Narcotic or Erethistic as well as Ecβολic. In the case of the Clavicipites and other Fungi, it would seem to me as if the Ecβολic effects might be dependent upon the Narcotic power; and in the case of the Actææ and perhaps the Rutacææ, which I have mentioned, it would seem to me as if the Ecβολic effects might be dependent upon the Erethistic power; but in all the other cases specified, the Ecβολic effects would seem to be much more prominent than the Erethistic ones, and this under all circumstances.

JUNIPERUS SABINA.

Juniperus Sabina (and I suppose that any other species of the genus would produce the same effect in a greater or less degree) has been long reckoned as an Emmenagogue, though it is not a

true and proper one, but it operates in this manner by virtue of an Adenagic power. It has also been long known that highly active Adenagics (of which this is one), if employed freely by a gravid woman, will very often produce Uterine Hemorrhage and Abortion or Miscarriage, according to the stage of pregnancy. When a physician is induced to lend himself to the purposes of the subject of illicit pregnancy, this article (or some other species of the genus) is oftener employed than anything else, because its use admits of considering the case as Paramenia Suppressionis, of course by an error in diagnosis, which is very liable to be made under such circumstances. Cases of this sort, in which this agent has been used successfully for the desired purpose, occasionally get wind, so that there can be no sort of doubt as to what it is capable of accomplishing. No doubt there are many cases which never get wind. But this is clearly not a true and proper Ecboic operation. Such articles can only be ranked as *Adenagica ad Ecbolesin producendum adhibita*. The active principle of Juniperus Sabina (and other species of the genus) has exactly the same composition as Camphogen or Oil of Turpentine, if it is not identically the same in all respects. Of course it has other powers beside those of an Adenagic, none of which need be mentioned here except that of a Cathartic, since no other except these two, conduce at all to its Ecboic operation. The reason is obvious then why this article can not be reckoned to possess a true and proper Ecboic power, but must be admitted to operate by a widely different one.

POLYGALA SENEGA. POLYGALA GRANDIFLORUM.

There are a number of Adenagics of quite a different character from Juniperus Sabina, that, when used freely in a state of pregnancy, sometimes produce abortion or miscarriage, but so far as I know, are never used expressly for this purpose. As one of these, we may mention Polygala Senega and also Polygala grandiflorum; and there are several other articles whose operation is exactly similar. These articles are Adenagics which are effectual Emmenagogues, and which are also Hydragogue-Cathartics, when their use is continued for any length of time. It is by virtue of the first of these two powers more especially, that they prove Ecboic, but the second also contributes more or less to it.

RUBIA TINCTORUM.

Rubia Tinctorum, though considered as a weak Adenagic and consequently a weak Emménagogue, is said sometimes to prove Abortifacient, but without any suspicion that it is a true and proper Ecboic. This I should not have suspected from any analogy.

TRILLIUM.

The premorse roots of the several species of Trillium have long had the popular reputation of being Ecboic, and have thence acquired the popular name of Birth-root, commonly corrupted into Beth-root. I have never met with a physician who had any knowledge of this matter, and all the accoucheuses that (within my knowledge) have pretended to employ the Trillia for this purpose, have been wholly destitute of all professional education. As respects the external sensible properties of these roots, they have a peculiar acrimony somewhat like that of Polygala Senega, and they also have the popular reputation of being effectual for the restraint of Hemorrhage. From what little I know of the Trillia, I have been in the habit of considering them as Adenagic, but this is little more than conjecture. I believe, however, that they are Emetic; but how valuable they may be for this purpose I know not. The natural order Trilliaceæ contains nothing that is known to be active except Paris quadrifolia, which is either Narcotic or Erethistic and Emetic. Only about thirty species are reckoned as belonging to this order. Trillium has about a dozen or fourteen species, (authors differ about the exact number,) all North American. One of these, however, is said by Sprengel to be found also in Kamtschatka. A priori, i. e., from sensible properties and natural-history affinities, this article is much more likely to be Ecboic than several other articles reckoned as such. If the several species of the genus Trillium are truly Ecboic, I can discover no reason to conclude that this is a secondary and dependent power. I know of no reason even to suspect that an Ecboic operation can be the effect of such a degree of Adenagic power as these species are supposed to possess; nor does it appear that they are ever pushed to the point of vomiting for the production of Ecblisis. I never even heard a suspicion that the Trillia are either Erethistic or Narcotic; and yet articles possessing such acrimony are very often the former, if not the latter; and in

addition to this, Paris, which is so nearly related, is one or the other. But their true powers are certainly very inadequately understood, and they require to be thoroughly and carefully reïnvestigated. If their popular reputation as Ecbolics had not been so universal, the quality of the evidence would not have entitled them to a notice in this place.

ARCTOSTAPHYLOS UVA-URSI,

Of late *Arctostaphylos Uva-Ursi* has been alleged to be Ecbol-ic; but long previous to my meeting with such a statement, I had been informed of operative effects of this article, which, if really produced by it, indicate an Erethistic power. Neither of these powers should I expect, a priori, to find in this article, though I should much sooner expect to find it Erethistic than Ec-bolic. As the testimony in favor of the former power seemed to be good, though received only from a single individual, I men-tioned it in my catalogue of Erethistics with a note of interroga-tion immediately preceding it, and with four articles, which, with the exception of the last, I had been more or less in the habit of using as substitutes for it, and which I considered as decidedly more active in the same way exactly, each likewise with a note of interrogation, implying that I put them down as Erethistics, with-out any personal knowledge that they are such, it being what I should not expect a priori. These four articles were *Andromeda Polifolia*, *Leucothoë Mariana*, *Cassandra calyculata*, and *Piëris ovalifolia*, the last an East Indian plant with which I am not per-sonally acquainted. As ordinarily kept in the shops, *Arctostaphy-los Uva-Ursi* has always appeared to me to be just about inert. But then, what I have thus met with, has always seemed to be old, and as I have supposed, imported from Europe, instead of collected from our own fields and upon our own mountains. The first three of the other articles that I have employed, have always been recent-ly collected. This may perhaps be sufficient to account for the superiority of the latter. The symptoms which indicate an Ere-thistic operation in this group of articles are those which have hitherto been considered erroneously as characteristic of what has been called an Acrid-Narcotic power. They are well known to be produced in a moderate degree by *Ledum*. It is this grade or de-gree of them that is said to have been produced by *Arctostaphy-los Uva-Ursi*. Even admitting that these articles are really Ere-

thistic, I should not think that they could be sufficiently so to enable them to prove Ecboolic by virtue of their Erethistic power; so that, as appears to me, if *Arctostaphylos Uva-Ursi* is really Ecboolic, it will be well worthy of examination whether all the group are not so likewise; and if one or the whole prove so, I think it will probably be by virtue of some other power beside an Erethistic one, since, as I have said, I should not think they can possibly be sufficiently active Erethistics to render them Ecboolics by that power. Nevertheless, if *Arctostaphylos Uva-Ursi* and the rest of these articles should really prove to be Ecboolics, I shall consider it as rather a remarkable coincidence, if they are also Erethistics. I consider it as sufficiently certain that *Ledum palustre* and *Ledum latifolium* are decided Erethistics. Now it appears to me that they will prove to be Ecboolic, if the rest of these articles are so, and even more actively Ecboolic than any of them. But I suspend my judgment for further observations upon the whole of this group.

ARISTOLOCHEIA.

The first three syllables of the name *Aristoloecheia* are a Greek attribute in the superlative degree, whose theme is the Greek name for Mars, the God of War, while the last three syllables are a Greek noun-substantive signifying "*the bringing forth of a child*," or "*parturition; child birth*," or "*delivery*." The attribute that constitutes the first half of this name is commonly translated *best*; or *most excellent*; though it really means *most valiant*; many of the ancients pretending that *valor* is the best thing in this world. The Greek noun-substantive which constitutes the latter half of the name *Aristoloecheia*, and which signifies *partus*; *puerperium*; *parturitio*; is of the feminine gender and has both a singular and a plural, while there is another noun-substantive nearly resembling it, which signifies *purgamenta post partum in mulieribus relictæ*. The latter may be distinguished by consisting of a plural merely, without a singular, by being of the neuter gender and by having a different accent. The name *Aristoloecheia* was anciently imposed upon one or more species of the genus of plants which still bears this name, because it was supposed to be "*herba puerperis opitulans*" (*Hedericus*) or because of "its use's being supposed to facilitate child-birth" (*Donnegan*).

Which of the species of the genus *Aristolochia* first acquired the reputation of being an Ecbotic I know not. I believe that there are several species found in the countries bordering on the Mediterranean. I am inclined to believe also that they all have a general agreement in their medicinal powers, and that what may be predicated of one of them, may be predicated in a greater or less degree of the whole. The species that were first adopted into the Pharmacopœiæ of Western Europe are *Aristolochia Clematitis*, *A. longa*, *A. Pistolochia* and *A. rotunda*; but doubtless other species were employed in the Levant before these; and probably all the species are quite as active and many of them more so.

There is something very peculiar in the external sensible properties of this genus in all its species. They are very bitter, which gives them a decided and even strong Tonic power, and beside this, they have a very peculiar flavor strikingly similar in all the species, which, when least intense is often called fragrant and aromatic, but when most intense is commonly called fetid. This quality is supposed to give what is called a stimulant power, when it is moderate; and what is called an Antispasmodic power, when it is considerable.

I am much inclined to believe that the *Aristolochiæ* when collected at the right time, when properly cleansed, dried and preserved, and above all when recent, are really both Euphrenic and Antisbestic in a greater or less degree (I do not pretend to know exactly how much) as well as Tonic. From their very peculiar external sensible properties, they are full as likely a priori to be Ecbotic as any of the *Rutacæ*, and more likely to be so than *Arctostaphylos Uva-Ursi*, and far more likely to be so than *Gossypium herbaceum*. But where are there any records of any observations or experience on this subject, which contribute to prove them to possess this power? Nothing can be established in the materia medica without many observations and much experience. This subject is certainly worthy of a careful investigation which I hope will be made before long. An Ecbotic and an Emmenagogue power are often confounded. These species have certainly had the reputation of being Emmenagogue. Has not the reputation of their supposed Ecbotic power been acquired in this way?

Ilex opaca.

A species of *Ilex*, that which is by far the most common in the

District of Abbeville (South Carolina) and which, without any particular examination, appeared to me to be the same as the species indigenous to Connecticut: viz. *Ilex opaca* (*Aiton*) as I have been informed by several physicians of the region, has a high popular reputation as an Ecboic, it being considered capable of producing abortion or miscarriage at any stage of pregnancy. A strong Infusion or Decoction of the leaves is the pharmaceutical preparation employed, and this is drank freely. It is supposed to be attended with uniform success in larger or smaller quantities. Its use is said to be confined to the Negroes; and yet I was told that no intelligent physician doubted its Ecboic efficacy, since its operation has been so often witnessed. What appeared to me surprising however was the fact that, so far as I could ascertain, no well educated physician had ever been known to make a trial of it even in a single case.

I am not apprised that *Ilex opaca* is either Narcotic or Erethitic, though I believe that it possesses several other powers, to none of which however, so far as I have information, can we attribute its alleged Ecboic operation. That a statement to such an effect should be circulating popularly, without professional verification, seemed at first so incredible to me that I was disposed to reject the whole as an idle tale, till the example of *Decodon verticillatus* occurred to my recollection, which has been in much the same situation in Connecticut, at least for very many years. I then resolved to give this statement and let it be taken for what it is worth. I can only add that I hope some one will either verify or disprove it, and one or the other of these before long.

DECODON VERTICILLATUS.

If a great amount of testimony will decide anything in medicine, *Decodon verticillatus*. (*Gmelin.*) is an Ecboic for certain brute animals. This effect is said to be the most frequently produced upon Ewes, next upon Cows and sometimes upon Mares. Any amount of testimony to this effect may be obtained from intelligent farmers, and even much from well educated physicians, who are either farmers themselves, or whose practice is in an agricultural region and almost wholly among farmers. Now if this agent operates as an Ecboic upon the brute animals that I have mentioned, it is maintained that it may produce the same effect upon the human subject; and yet I am not apprised that this has

ever been verified. In fact the real powers of this article are not known. It has been reputed to be Narcotic; but I consider this as more than doubtful. It has been said to produce effects which would make it an Erethistic; but I think the evidence upon this subject is deficient. It has been supposed to be what I call an Adenagic; but has never been shown conclusively to be so. In more than one instance, a company of medical students associated in my office, and under my superintendence, for the purpose of ascertaining its general operative effects upon the human subject, if it produces any, and of ascertaining whether it is abortifactive upon the Cat and the Dog; but it happened that I was obliged to be otherwise occupied, and indeed away from home, at the times selected by the young men, and consequently their investigations were relinquished without any definite or reliable results. It was from a single experiment upon one of these occasions, that one of the gentlemen, of an uncommonly susceptible temperament, supposed that he experienced symptoms of moderate Narcosis; but I did not think there was adequate evidence of such a fact. The natural order Lythraceæ to which this plant belongs, affords no medicines of any material importance. It is said to contain a few feeble Styptics; one active Diaphoretic which is more probably an Adenagic; one Hydragogue-Cathartic; one Narcotic; one or two Vesicatory-Oresthetics; and one Febrifuge reputed to be useful in Intermittent, beside the article now under consideration; and this is all the known medicinal articles in at least three hundred species. Lindley mentions this article under the name of *Nesæa verticillata* and tells us "it is said to destroy the young of cattle heavy with calf;" but he does not give his authority for this. (*Lindl. Veget. Kingd. Lond.* 1846, *Pg.* 575). For the single Febrifuge article which he mentions, he gives no authority; but it is from Martius. (*Car. Frid. Phil. Mart. Syst. Mat. Med. Veg. Bras. Lips. et Vind.* 1843, *Pg.* 8.)

GOSYPIUM HERBACEUM.

This article has lately been brought before the public in the U. S. A. as an Ecboic. The first intelligence that I ever received of its use for this purpose was about 1848, from a young physician of Connecticut, who some time previous (I should think several years, but how long exactly I can not now recollect) had spent some time in Louisiana, where he had witnessed its employment

among Negro women as an Ecbohc at the full time of parturition, and heard of its use to produce abortion. He thought that the physicians of that region were all well acquainted with the fact that *Gossypium herbaceum* produced this effect, and that they sometimes prescribed it themselves. This young man professed to have administered it himself, and to have found it full as efficacious and full as certain in its effect as *Claviceps* itself. On inquiring for the origin of this practice, he said that nobody certainly knew it, but that it was supposed by some to have been brought from Africa by Negro women kidnaped after adult age. Now I believe that this species of *Gossypium* is indigenous to Africa. So incredulous was I upon this subject, that I asked for the names of some well known medical gentlemen, to whom I could write for further information on the subject; and several were mentioned who were men of distinction. I never however made any inquiries of them, through reluctance to trouble them. Since the time that I received this first information, I have met with various communications on this subject in the periodicals. In this place I will only mention one from Dr. Frost (*Charlestown Med. Jour. May 1850*); one from Dr. Bouchelle (*West. Jour. Med. and Surg. Aug. 1840*); one from Dr. Cabell (*Va. Med. and Surg. Jour. Vol. iii. Pg. 8*), etc. Dr. Cabell mentioned that Prof. Mettauer relies especially upon an *Æther Gossypii* as the best pharmaceutic preparation; though that which has been commonly employed is a Decoction of the cortical part of the stem and root (of course collected in the full flowering season, because this species is certainly annual with us) in the proportions of four ounces to two pints of water, to be boiled to the consumption of one half. Its certainty of operation is much insisted upon, by those who have employed it.

I know of no ground even for suspecting *Gossypium herbaceum* to possess either a Narcotic or an Erethistic power; but does it not possess some other power beside that of an Ecbohc? If it does not possess any other, it is the only pure Ecbohc known. Till it is sufficiently settled that it does not possess any other power on the one hand, or what other power or powers it does actually possess on the other hand, we can not decide how it proves Ecbohc. The species of *Gossypium* all have a very near affinity with each other; and if *Gossypium herbaceum* has such a power, it is ex-

tremely probable that the other species cultivated in the U. S. A. have the same. Now beside *Gossypium herbaceum* (Linn.) I think I have seen *Gossypium Barbadense* (Linn.) called Sea-Island-Cotton, and *Gossypium religiosum* (Linn.) called Buff or Nankin-Cotton; and a friend has ascertained for me *Gossypium hirsutum* (Linn.) called Upland-Georgia-Cotton. I do not know that the whole natural order *Malvaceæ* contains more than two articles beside *Gossypium* that are more, or any otherwise active than merely Leantic. The root of *Sida lanceolata* is said to be intensely bitter, and is considered a valuable Stomachic-Tonic, (*Lindl. Veget. Kingd. Lond.* 1846, *Pg.* 367-70), and the seeds of *Abelmoschus Moschatus* have the reputation of being moderately Euphrenic. The Ecboic activity of *Gossypium* is therefore contrary to all natural history analogy.

In the present state of our knowledge, *Gossypium herbaceum* must be reckoned as a simple and pure Ecboic, and is the only article that can be reckoned as such. I can hardly believe that it will remain so, long, since classes founded upon one single article are not usually well founded, and consequently not stable; and in conformity with this principle, I am satisfied that this agent will be shown not to be a true and proper Ecboic (i. e. it will be shown to produce its effects by means of some other power already the foundation of some other class), or other unequivocally true and proper Ecboics like it will be ascertained. For these reasons I should have reserved the mention of this article till the very last, that all the rest may be judged of, independent of it; though upon the principles of correct classification, it ought to have been considered first, as (in the present state of our knowledge) the only simple and pure, if not the only true and proper Ecboic. But I have only mentioned specimens, not the whole of the articles belonging or supposed to belong to the class, which requires no rigid and exact arrangement.

ACIDUM SUCCINICUM.

In the early part of my professional life, I repeatedly received information derived from several of the oldest physicians then on the stage, that Succinic Acid was an effectual Ecboic. These gentlemen alleged, as a result of observation and experience, that, in a suitable dose, it did not oftener fail of producing this effect than *Exogonium Purga*, *Rheum (officinale)*, *Aloë vera*, etc. like-

wise in suitable doses, fail of proving Cathartic. These gentlemen professed to have been long in the habit of employing it with success. Several of them were then well acquainted with the Claviceps, and had long been so, but professed to prefer Succinic Acid. On inquiring what other medicinal powers belonged to this Acid, the answer always was those of a Nervine and of an Antispasmodic, by both of which I understand what I now call Euphrenic. The gentlemen who gave this information were well educated, intelligent and judicious practical men. Such testimony is assuredly worthy of respect and investigation. By some means or other, I either omitted to inquire into the origin of this practice, or if it was ever communicated to me, I have long ago forgot it. I do not now recollect ever meeting with any printed authority for it, though I have seen printed authorities for the Ecbohic power of Claviceps purpurea bearing date sometime previous to 1700. In consequence of this early information in regard to Succinic Acid, I have always been in the habit of mentioning it to my professional pupils as a Euphrenic and Ecbohic, though I never more than half believed this. From its composition (it being a compound-radical of Hydrogen and Carbon acidified by Oxygen), I should think it much more likely to be an Antiphlogistic, and perhaps a Neuragic. But I have always neglected to verify or disprove its reputed powers, or to procure their verification or disproof, and consequently have remained a kind of skeptic in regard to its powers either one way or the other. The truth is that testimony seems to be worth less in medicine than in any other department of human knowledge. "Quod ubique, quod semper, quod ab omnibus creditur" can scarcely be said to be any more worthy of belief than if it were entirely new. It is scarcely an argument against the correctness of the ascription of these powers to this article, that they have been so long in oblivion, since the same has happened in regard to more active articles, and even to Claviceps. For myself I heartily wish that some body would thoroughly investigate the whole matter, and whatever may be the result, give it to the public.

SODÆ BIBORAS.

This article is said to have been extolled by the ancients, but for exactly what purpose, I do not now recollect; and in this connexion it is not necessary to examine, so long as it was not for the

power of which I am now treating. Homberg is well known to have thought highly of it; but it is not necessary to make reference to him in this place. But the Biborate of Soda has lately been brought before the public as an Ecbolie, and of course as a remedy for Uterine Hemorrhage by virtue of this power. From the external sensible properties of this Salt, and the general character it has sustained hitherto, this is such a power and operation as we should not now expect to find in it, and therefore it behoves us to weigh well the testimony on which this ascription depends. Gmelin is said to cite numerous authorities in proof of its Oxytocic power. In the Virginia Medical and Surgical Journal (*Vol. iv. Pg. 146, Feb. 1855*) a case is quoted from a Belgian Periodical, of an obstinate Metrorrhagia, as it is called, due to the presence of a Uterine Polypus in which large doses of this Salt occasioned the expulsion of the Polypus in three days, or at least, was supposed to have occasioned it. In opposition to this, Duchateau (*Bul. de la Soc. Méd. de l'Emulat. November 1816*) declares that he has used Biborate of Soda in numerous cases of parturition, and that it is utterly destitute of any power over the uterus. This, it should be observed however, is mere negative testimony. Trousseau and Pidoux (*Traité de Thérap et de Mat. Méd. Vol. i. Pg. 358*) think that the Ecbolie power of this Salt is yet to be proved. This is given only as a specimen of the state of professional opinion in regard to this article at the present time, though it must be admitted that it is very much the same, upon most medical topics. Now if this article is really Ecbolie, I should think that it must be by virtue of a true and proper Ecbolie power, as according to my definition, since there is no reason to suppose that it has any other power or powers to which an Ecbolie effect can possibly be attributed. It is alleged also to be Aphrodisiac. Dr. J. C. Hubbard (*N. J. Jour. Med. November 1848*) pronounces it eminently Aphrodisiac when used in enema. I have long considered it as certain that there is no true and proper Aphrodisiac power, this effect being always produced either by a Euphrenic, an Erethistic, an Oresthetic, an Antisbestic or a Tonic. Now neither of these powers belong to this article, nor does any other power to which we can reasonably attribute an Aphrodisiac operation. Parr (*Med. Dict. Vol. i. Pg. 268*) says of this Salt, it is useful in Fluor albus so called. If there is no mistake in re-

gard to this supposed fact, by virtue of what power does it relieve *Blennorrhoea vaginalis*? Assuredly not by that of an Ecboleic, nor by that of an Aphrodisiac, even admitting this latter power to be correctly ascribed to it. But I do not consider that this statement even contributes to prove any thing. Some woman laboring under this disease, probably took this article and got well after it. In order to prove any thing, it should be shown that this Salt has some property or power capable of rendering service in such cases. In the early part of my professional practice, I often prescribed this article just as the old physicians of that day were accustomed to do; but never perceiving any unequivocal or certain effects from it, I gradually ceased to employ it. Since that time, I have not infrequently been associated in the charge of a case, with some old practitioner who was desirous of administering this Salt, to which I never objected. Still I have never been able to procure any effects whatever from it. From its composition and the analogy of other Salts, I should expect to find it more or less Antiphlogistic, and perhaps somewhat Neuragic; and I still suspect that in sufficient quantity, continued for a sufficient length of time, it would operate feebly in this way; but I must admit I never witnessed any such effects from it. If it is really in any degree Antiphlogistic, such a fact will contribute to show that it can not possibly be Aphrodisiac, since Antiphlogistication produces the opposite effect, as I believe in all circumstances and cases. On the whole, I never met with any evidence that this Salt is worthy of belonging to the *materia medica*; and it certainly requires more testimony than I have ever met with, to render it in any degree probable that it is either Ecboleic or Aphrodisiac. In fact, all probability is against its being either. Lobstein, I believe a physician of Strasburg, is said to have published a paper upon it in the *Journ. de Méd. de Leroux*. T. xxxv. Pg. 137; but I have not now access to this periodical and can not say what its scope may be.

NAUSEA PROTRACTA.

Nausea protracta, much more especially if produced by Antimony, is reputed to be very effectual for facilitating parturition; and I have heard of practitioners of obstetrics who have thought so highly of this process as to employ it often, in fact, in almost every case. I can not then doubt of its power. I think that it

acts mainly by enfeebling the parts dependent upon the nerve of chymical action, nutrition and reproduction, which are strictly the vital parts of the system; for, as I have elsewhere said, every thing that exhausts these parts tends to cause the gravid uterus to throw off its burthen. But I like this process as little as the next to be treated of.

EMESIS ANTIMONIALIS.

Active and especially protracted Antimonial Emesis not infrequently produces abortion and miscarriage; but this is mainly due to the violent shock or strong impression of the act of vomiting, though doubtless somewhat to the Nausea and the exhausting influence of the Antimony. When parturient contractions are feeble and the process is lingering, I have known the use of Antimonial Emesis to expedite it, and it is declared to be effectual for this purpose; but it is a process that I deem very objectionable for this purpose, notwithstanding the fact that spontaneous vomiting seems to be serviceable and that without any alloy. I need not in this place go into the grounds of my objections to Antimonial Emesis in parturition, since I am only endeavoring to show what agents and processes are capable in any case of proving Ecboic, and by what powers they appear to do so.

CATHARSIS DRASTICA.

CATHARSIS PROTRACTA.

CATHARSIS ALOETICA.

Catharsis drastica as with *Ecbalium Elaterium*, *Luffa* ? operculata and various other articles; Catharsis protracta and Catharsis Aloëtica are well known to be capable of proving abortifacient. Probably Catharsis with *Polygala polygamum* and with Extract of the root of *Convallaria Majalis*, both of which operate very much like *Aloë vera*, would operate in the same manner. So far as I know, nobody suspects these processes of operating by any other power than their Cathartic power.

ARTUUM LIGATURÆ.

Ligatures upon the limbs have been recommended at least (if not employed) for the purpose of an Ecboic. In fact I have had testimony of their successful employment, as is believed, with all the benefit ever derived from Depletion of Blood, but without any of the ill effects of the latter. By the application of a Ligature or Tourniquet to one arm near the shoulder, and to the leg

of the opposite side near the trunk, both being tight enough to hinder the return of the blood in all but the deepest seated veins, I should think that at least one quarter of the whole mass of the blood, if not more, may be temporarily and transiently abstracted from the trunk. In a short time the Ligatures or Tourniquets may be removed and applied to the opposite side and so alternated several times. By such management, all the desired effects of two or three much fuller Bleedings than would be compatible with the welfare or even safety of the patient, may be obtained, without any of the highly injurious sequels even of one ordinary full Bleeding in such circumstances. *Artuum Ligaturæ* produce (though only temporarily and transiently) the same effects as Depletion of Blood, but in a more powerful degree for the time being, and consequently operate by the same power or powers.

SANGUINIS DEPLETIO.

Abstraction of the Blood is certainly Ecbolie either directly or indirectly, but in all probability not by a true and proper Ecbolie power. Under the general diathesis of diseases which has prevailed since I have been in the practice of medicine, Depletion of Blood has certainly been a very effectual Ecbolie. Early in my career, I was called to bleed a gravid woman in whom there were no morbid symptoms whatever, but merely for fashion's sake. As I had been better instructed than to comply, I objected; but the subject took the case so far out of my hands as to insist that she would be bled at all events, and to assert that if I would not perform the process she would call some body that would, if she should be obliged to call a dozen physicians. It seemed not worth while to combat so much resolution, and therefore I abstracted about twelve ounces of blood. An abortion took place the night following. At that time I did not connect this with the Bleeding, nor did I object to the process from apprehension of this event, but simply on the ground that the woman was perfectly well, and I did not think it proper to employ any medicinal measures when there was no occasion for any. I had always been taught not to prescribe any thing without some good and adequate reason. I was subsequently called upon a number of times in similar circumstances, in which I complied with the wishes of the subject—I will not say patient, for such was not the fact; and when I abstracted more than about eight ounces of blood, there was gener-

ally an abortion or miscarriage, and sometimes when I took no more. The abortion commonly occurred within twelve or twenty-four hours, though sometimes it did not happen in less than two or three days, and was not connected by the subject and her friends with the Bleeding, nor even by myself. At last however the relation of the effect to the cause became too obvious for doubt. Subsequently I wholly refused to abstract blood under such circumstances, and very often my employers have called in another man who would be more complying. Whenever I have known the result, as I usually have, it has been as in my own hands. Sometimes I have been well satisfied that the subject very well understood what the effect would be, but I never heard it avowed but once. Subsequent to the change of diathesis above alluded to, the old physicians then on the stage found (to use their own language) that gravid women would not "bear" bleeding as well as formerly, and they gradually discontinued the process. At the present time, at least within the circle of my acquaintance, the custom has fallen into desuetude. I have certainly known enough of the operation and effects of this process solely for the purpose of producing abortion or miscarriage, and for facilitating and expediting difficult parturition, to be confident that Bleeding has great power as an Ecboic or Partus accelerator, were it not objectionable on account of its sequels, which are very slow and lingering recovery and all the disastrous effects of Uterine Hemorrhage. I have known an apparently vigorous constitution very greatly impaired by a repetition of this process in two or three successive parturitions. In fact it seems to me that women when gravid are more injured by Depletion of Blood than under almost any other circumstances. I can not therefore believe that this process was as unexceptionable under the diathesis that prevailed generally previous to 1807, 6 or 5 as was commonly supposed. There were then certainly many women whose health was permanently destroyed (according to the most ample and unexceptionable testimony) by Blood-letting during repeated uterigestations and parturitions.

By what power does Depletion of Blood prove Ecboic? I doubt not by its strong impression, its disturbance of the functions of all the parts dependent upon the nerve of chymical action, nutrition and reproduction, and by the direct exhaustion which re-

sults to these subordinate parts of the system—parts which may be considerably weakened without any intermediate weakening of the voluntary muscular system, the only weakness of which some physicians ever take cognizance. Any material reduction of the vital energies of these vital parts in a gravid woman, always either produces abortion or miscarriage, or a strong tendency to it.

PYRECTICA. PHLOGOTICA. EXANTHEMATICA.

Certain acute Febrile diseases are well known to be liable to interrupt the process of uterigestation and to occasion abortion or miscarriage, and even death in connexion. No one of these is more liable to produce this effect than Enteritis Typhodes-notha vel Dysenterica, or Dysentery. Some times by what is considered very peculiar treatment (but which I consider best in all cases and all subjects) I have succeeded in preventing these results. Pneumonitis Typhodes-notha vel Dysenterica (whose topical Phlogosis is of the same specific character as that of Dysentery) is very liable to produce the same effects as Dysentery, but yet not quite as liable as that disease. The same consequences not infrequently result from common Typhus nervosus, but not as often as from the two preceding. The same treatment in the last two, as in the first, is often successful in saving the patient. Each of these diseases proves abortifacient by the exhausting operation which they exert upon the parts dependent upon the nerve of chymical action, nutrition and reproduction; though in Dysentery the intestinal irritation, and the frequent rising for intestinal discharges, which most physicians permit, are powerful auxiliaries to the Febrile part of the disease.

MEMBRANARUM OVI RUPTIO.

Every medical gentleman perfectly well knows the effect of rupturing the membranes of the ovum, so that all that is necessary is to mention it, that it may not escape recollection in this connection.

I think that I have now specified agents that operate as Ecbolics in all the different and various modes now known. Will any body pretend that all which I have named operate in the same manner, and by virtue of one and the same identical power? If not, how many powers are there which are capable of producing the effect under consideration? I have been long satisfied that agents and measures which contribute to exhaust the vital ener-

gies of those subordinate parts or organs of the animal system, whose functions depend upon the nerve of chymical action, nutrition and reproduction, contribute in just about the same proportion to facilitate and expedite Ecblexis; or in other terms, Antiphlogistics, if employed with sufficient efficiency, produce this effect; and so do Nausiatics, Antimonial Emetics and drastic Cathartics; and also Febrile diseases which have their principal and essential seat in the parts which depend for the exercise of their functions upon the nerve just mentioned.

Narcotics and Erethistics operating in a certain manner (as I trust I have already shown) have the power of facilitating and expediting Ecblexis. It may be considered as quite well determined that certain Adenagics, when efficiently administered, are decided Ecbolics. Various processes that rank under my class of Ergastics, as Saltatio or Dancing, Equitatio or Riding on Horseback, Vehiculatio or Riding in a Carriage, particularly if it is not well hung upon its springs, or is drawn over a rough road or a cobble-pavement, will often produce abortion or miscarriage; the latter in more than one sense. How often have we seen one or the other of these effected by a gravid woman's riding for her health, at the suggestion of some wise woman, and contrary to the advice of her physician. How many of the agents which I have mentioned as having the reputation of being Ecbolics do not possess one, two, or several of these powers? But very few indeed, I will venture to affirm.

Claviceps purpurea and some other Fungi which I have mentioned I think are sufficiently Narcotic, and Narcotic in the right way to account for their Ecbotic power. Others may entertain different opinions. I have given my reasons for my own views, and therefore leave every one to his own convictions. If Claviceps purpurea is a true and proper Ecbotic, what, beside other Fungi mentioned in connexion with it, have sufficient analogy with it to be at all likely to be true and proper Ecbolics.

Botrophis Actæoides is certainly sufficiently Erethistic, and Erethistic in the right way to account for its Ecbotic operation. The same remarks may be made of Botrophis Actæoides as of Claviceps purpurea: viz. admitting that this is a true and proper Ecbotic, what analogy does it furnish in favor of a true and proper Ecbotic power in any other article mentioned, except the Actææ?

The Actææ appear to be sufficiently Erethistic to account for their Ecbotic power, but whether this is admitted or not, I have too often witnessed their Ecbotic operation to have any doubt about it, and so have several of my friends, who never publish any of the results of their practice. It may be properly noticed here that the Actææ are Adenagic as well as Erethistic, but they possess the former power in such a moderate degree, in comparison with the latter, that I am not inclined to believe that it has much influence in their Ecbotic effects.

I should think that Ruta and Dictamnus might be Erethistic enough to render them Ecbotic. The fact that these articles are active only when used recent, has prevented my ever employing them. According to the habits of our apothecaries, they will not put up prescriptions of such articles.

Lobelia inflata is not only Erethistic but Adenagic, and if freely used produces a sufficient amount of both these operations to account for its Ecbotic effects.

Sanguinaria vernalis is still more Erethistic and more Adenagic than Lobelia, and doubtless proves Ecbotic by one or both of these powers.

Veratrum viride is still more Erethistic and still more Adenagic than Sanguinaria and needs no other power to account for its Ecbotic operation.

Tanacetum vulgare has a sufficient number of different and distinct powers, and each is sufficiently active and intense to leave the conviction that it is Ecbotic, as far as it possesses this power by virtue either of the whole aggregate of these, or by some two or more of them, I am unable to say which. If its Narcotic power produced the right sort of Spasms or Convulsions, I should be inclined to attribute what Ecbotic operation it ever exerts to that power; but I have no knowledge that any Narcotic producing clonic or Epileptic Spasms or Convulsions is ever Ecbotic by virtue of this power. If this article were only Erethistic (and it may be for aught I know) it would be less difficult to account for an Ecbotic operation.

Juniperus is most decidedly Ecbotic by virtue merely of its Adenagic power. It must be admitted however that several of the reputed Ecbotics that do actually possess one or more of these powers, which sometimes occasion Ecbleis without any true and prop-

er Ecbolie power, do not seem to possess a sufficient degree of them to account, reasonably and satisfactorily, for their Ecbolie operation.

It really does not seem to me that *Rubia Tinctorum* can possibly be sufficiently Adenagic to be capable of proving Ecbolie by virtue of this power; and yet, when the root is recent, and has been taken freely, it sometimes proves decidedly Emmenagogue; and if it is Emmenagogue, it may prove Ecbolie by the same power.

Even if *Trillium* is Adenagic, as it is supposed to be, is it sufficiently so to render it Ecbolie by virtue of its Adenagic power? As far as I am acquainted with this genus, I should think not. I do not think that there is adequate testimony to its supposed Narcotic power, and even its Ecbolie power very much lacks evidence.

I can not believe that *Arctostaphylos Uva-Ursi* possesses a sufficient amount of Adenagic power to render it Ecbolie by virtue of such power; and I may make the same observation in regard to its reputed Erethistic power; nor is it probable that it is Narcotic, as I have heard conjectured. Beside all this, I do not think that there is by any means sufficient testimony to its Ecbolie power.

Admitting that *Aristolochia* is a Tonic of that sort, the primary manifestations of whose operation are in the organs of primary digestion, which is doubtless the fact; and admitting further that it is Antisbestic and moderately Euphrenic in addition, neither of these powers is known ever to produce Ecbleisis. If it is Ecbolie then, it must be by virtue of a true and proper Ecbolie power, as according to my definition. But is there adequate evidence of this? I think not. I never had a suspicion of its possessing any other power.

As appears to me, the testimony of the Ecbolie power of *Ilex opaca* is altogether inadequate, as it is to its power of curing Intermittent. If this latter is true, it will indicate that it is one of those Tonics the primary manifestations of whose operation are in the Sanguiferous system. I am not apprised that any article ever proves Ecbolie by virtue of its Tonic power. I can not perceive how this sort of Tonic power can possibly produce Ecbleisis. I have no knowledge that this article possesses any other power.

Although there is much testimony to the Ecbotic power of *Decodon verticillatus*, yet it is all from non-medical persons, and relates to brute animals. There is no testimony to its possessing any other power.

As to *Gossypium herbaceum* I do not think there is sufficient evidence that it possesses any power. All the evidence that there is, is in favor of its being Ecbotic; but it is so easy to fall into error as respects this operation, that we ought to require a considerable number of cases to decide the question. What analogy is there between *Ilex opaca*, *Decodon verticillatus* and *Gossypium herbaceum*? Admitting either of them to be a true and proper Ecbotic, such a fact lessens the probability that the other two are so, on account of their great diversity.

If either Succinic Acid or Biborate of Soda were proved to be a true and proper Ecbotic, such a fact would render it less probable that the other should be so. I do not know that the Biborate of Soda possesses any other power, though I suspect that it is Antiphlogistic, but in too feeble a degree to prove Ecbotic by virtue of this power. Almost exactly the same may be said of Succinic Acid as I say of Biborate of Soda. It is no more certain that it possesses any other power than that it possesses this.

No other class consists of a list so utterly discrepant and opposite in their properties generally, and in their natural-history relations and in their proximate and ultimate or elementary composition, so far as we know it. Can it be possible that such a heterogeneous group of articles, several of them so active in such different ways, and several of them so utterly inert in all other respects—articles with such a diversity and even opposition as respects natural-history affinities, should possess a true and proper Ecbotic power—a power whose existence has never yet been proved?

NEXUS TERTIUS.

ERRHINA.

ESSTOMATICA.

EMETICA.

CATHARTICA.

The third nexus, alliance or group of classes may be considered as characterized by the circumstance that their essential operation consists in a supposed remedial irritation and consequent evacuation from excretories, to the outer extremities of which the agents are immediately applied, and upon which they are commonly supposed to make their sole impression. I do not think that the evacuation produced ever contributes to the remedial efficacy of the processes, at least in any material degree; but a different opinion is entertained, as I believe, by most physicians. This character is strictly true of the first two classes of this nexus, alliance or group, but I doubt whether it is perfectly so of the last two. I have elsewhere said that I do not attach much importance to this grouping of the classes, or to the characters which separate the groups, and therefore it is not worth while to multiply the groups. If it were worth while to increase the number of groups, the last two classes of the third nexus might very well be separated from the first two.

PROËM TO THE CLASS ERRHINA.

The term Errhina is ancient and classical Greek. It is compounded of a preposition signifying *in* and a noun-substantive signifying the *nose*. I employ the term Errhina in application to this class of agents only for want of a better name. It signifies simply something put into the nose, but has no sort of reference to any effect produced. It has reference only to the manner in which the medicine is administered and not at all to the two operative effects which all Errhines produce. This is without parallel in any classification except my own. The next class of which I shall treat will be named upon the same principle, because the name now employed by authors can not be retained; because it

has a great affinity with the Errhines; because it seems to require an analogous denomination; and above all because I have been unable to devise any more appropriate appellation. If any body will suggest better names, I shall be ready to adopt them. But there is another reason still why I have more readily acquiesced in names which I know to be incorrect, viz. the fact that I do not believe there is any good foundation in the *materia medica* either for the Errhines or the next class, which I shall call *Estomatics*; i. e. I do not believe that either group of articles ever proves medicinal by virtue of the only two operations which are exerted by the whole of these two classes, viz. the topical irritation and the increased discharge.

Definition. Errhina or Errhines are articles, which, by direct topical application to the Schneiderian mucous membrane, produce a peculiar irritation in that texture, some times occasioning Sternutation or Sneezing, and always increasing secretory activity in the mucous follicles, and causing them to effuse a larger quantity and a thinner quality of the proper secretion.

Cullen says that "Errhines are medicines which procure a discharge from the nose, some times of a mucous and some times of a thinner fluid; but which in both cases we suppose to proceed from the mucous follicles of the Schneiderian membrane upon the internal surface of the nose, and of cavities adjoining it." (*Cull. Mat. Med. B. S. Bart. Edit. Philad. 1812, Vol. II, Pg. 303.*) The only material objection to Cullen's definition is, the omission of a clause stating that the effect produced must be by the topical application of the Errhine to the part from which the secretion is to come. If the effect should be produced by an article taken into the stomach it would be that of a *Blennagogue* and not that of an Errhine, which are two quite different powers and operations, though in both cases an increased secretion of mucus is the result. Cullen says also, that "the evacuation is some times procured without any Sneezing, but is frequently attended with it." "This however, implies no difference, but merely that of stronger or weaker stimulus in the medicine employed." "The Sneezing that occurs may have particular effects by the concussion it occasions; but it does not vary the evacuation induced by the medicine, excepting that with the Sneezing there is commonly a larger evacuation produced." (*Ibidem.*) Sneezing certainly has

no sort of connection with Stimulus in the legitimate sense of this term, and scarcely any with an Oresthetic operation. Some of the most powerful Sternutatories (using this term in the sense of articles that produce Sneezing merely,) are neither stimulant, nor even acrid without being Stimulant, as Diprotosulphate of Mercury for example. I have seen powerful Sneezing from finely pulverized Loaf-Sugar. This is assuredly neither Stimulant nor an Acrid-Oresthetic. Cullen specifies only six Errhines, only one of which in its dry state, is naturally acrid. To Cullen's list B. S. Barton adds three more, neither of which, in the dry state, are materially acrid.

John Murray says that "Errhines or Sternutatories are substances which occasion a discharge from the nostrils, of a mucous or serous fluid." *J. Murr. Syst. Mat. Med. and Pharm. Fr. 4th. Edinb. Edit. N. Y., 1828, by J. B. Beck, Vol. I. Pg. 241.* Murray's definition has exactly the same deficiency as Cullen's, and the same objections may therefore be made to it, which it is not necessary to repeat. It ought however, to be added that this deficiency is supplied in the subsequent remarks, though it ought to have been embodied in the definition, since Murray says at last that "Errhines operate by direct application, and generally in consequence of a slight acrid quality." He adds however, "any substance in fine powder snuffed-up the nostrils has this effect in a certain degree; but as is to be expected, it is more copious as the substance is more acrid or Stimulating." "The discharge as produced by different Errhines, varies in extent, and in the time during which it continues." "Some also occasion a sense of heat, or even inflame the membrane to which they are applied, while others have no such effects." (*Ibidem.*)

As the subject of the necessity of acrimony to an Errhine is here mentioned for the first time, it may as well be disposed-of in this place, as later in the proëm, more especially as little need be said about it. Some Errhines are acrid, but acrimony is not necessary to an Errhine power, since there are many non-acrid as well as acrid ones well known and employed. Those articles possessing that sort of acrimony that has a strong tendency to produce Erythematic Phlogosis in delicate textures should always be avoided as Errhines, since Phlogosis is incompatible with increased secretory activity of the mucous follicles, except secondarily, and

that for the secretion of pus; but those articles that possess a sort of acrimony that has no tendency to produce Phlogosis are the most active or efficient agents of this class. Acrimony to any material amount is certainly not necessary to an Errhine, even an efficiently active one, but is rather a disadvantage to it; so that they are mistaken who suppose that its activity is proportioned to the degree of its acrimony, and that the only difference between the several Errhines depends upon the degree of their acrimony. The more acrid an Errhine happens to be, as a general rule, the greater is its tendency to produce an Erythematic Phlogosis; yet even this statement requires some qualification, for there is a sort of acrimony that produces a copious secretion from the Schneiderian membrane, with very little tendency to produce an Erythematic Phlogosis. As a general rule, the more the Errhine tends to produce this last mentioned effect, the smaller is its value as an Errhine. Certain preparations of *Nicotiana* of several species are very active for the production both of Sternutation and an increased secretion of mucus from the Schneiderian membrane, though they possess very little acrimony, indeed scarcely any. It might be said with a much nearer approximation to the truth, that the activity of these preparations, is proportioned rather to their dryness than to their acrimony. J. Murray mentions ten Errhines, eight of which can not be reckoned as acrid, and even one of the other two in the dry state in which it is employed can hardly be said to operate as an acrid. The production of Erythematic Phlogosis, and much more of Ulceration, or even the secretion of pus without Ulceration I do not consider as by any means a legitimate Errhine operation, and not even an Ultimate-Errhine effect. Such effects are purely morbid, without any relation to an Errhine operation.

Richard Pearson says "Errhines called also Sternutatories, are acrid substances applied to the nostrils for the purpose of Stimulating the sensorium commune through the medium of the olfactory nerves, and of promoting the discharge of mucus from the nose." (*Rich. Pears. Pract. Synops. Med. Aliment. and Med. Lond. 1808, Pg. 119.*) It will be noticed that the first particular of Pearson's definition is that "Errhines are acrid substances applied to the nostrils," the latter a circumstance not entering into several of the definitions of authors, though implied by the

name. Richard Pearson treats of only nine Errhines, eight of which in the dry state in which they are commonly employed as Errhines, are not materially acrid.

I trust that sufficient has been said in reference to the necessity of Acrimony in an Errhine, and also in reference to the fact that it must be taken into the nostrils in order to belong to this class. But the purposes for which Pearson supposes that Errhines are always employed require some consideration. These are "Stimulating the sensorium commune through the medium of the olfactory nerves," and "promoting the discharge of mucus from the nostrils." What is the sensorium commune which is so often mentioned? In its widest and most general sense, I should think it must mean the seat of perception which I suppose must be the hemispheres of the cerebrum. If these organs do not constitute the sensorium commune, I do not know where to find it. Is it true that the Errhines are ever applied to the nostrils for the purpose of producing "a quickly diffused and transient increase of vital energy and strength of action" in the hemispheres of the cerebrum, an operation of which the olfactory nerves are to be the medium? In what manner can a quickly diffused and transient increase of vital energy and strength of action in the hemispheres of the cerebrum be recognized and measured? Can the olfactory nerves transmit any impressions but those of odorous substances? Does any part of the effect of an Errhine depend upon its odor? Is a quickly diffused and transient increase of vital energy and strength of action ever capable of being produced in any part or organ by an odor merely? Pearson makes no objection to what he calls *Hydrargyrus Vitriolatus*. He commends *Teucrium Marum* because it has little acrimony and no Narcotic power. If Errhines are acrids, operating through the medium of the olfactory nerves, we should suppose that the more acrid and the more odorous the better as an Errhine. On the whole, Pearson seems to think the leaves of *Asarum Europæum* as perhaps the best of the Errhines. He says that it possesses "great activity but a degree of virulence which renders its use in any other way except as an Errhine hardly advisable. He considers *Veratrum album* as almost too virulent for an Errhine. He admits it however, with "very great caution," just as he does *Asarum Europæum*. As an Errhine he says that *Rosmarinus officinalis* has more odor

than activity. This remark was unexpected after his definition of an Errhine. Under Pearson's views ought not the most odorous substances, instead of the most acrid, to be the best Errhines? In his catalogue of nine Errhines only four, viz. *Asarum Europæum*, *Lavandula Spica*, *Majorana vulgaris* and *Rosmarinus officinalis* are odorous, in consequence of containing essential Oils, but in this list, that which is least odorous is altogether the best Errhine. Pearson says that as an Errhine, *Majorana vulgaris* is superfluous; and that *Lavandula Spica* may well be dispensed-with. He considers the root of *Iris Florentina* as a very inferior Errhine, and he says "it may therefore be dispensed-with."

But admitting the possibility that the sensorium commune, or the hemispheres of the cerebrum, if these are the same, can be really and truly stimulated, "through the medium of the olfactory nerves" by odorous substances, of which I have not the least belief, what diseases will such a process cure? Pearson's only specification of diseases are Ophthalmitis and Cephalalgia as cases in which Errhines of *Nicotiana* are appropriate; Apoplexia, Lethargus, Deafness and other diseases of the head, as cases in which Errhines of *Veratrum album* are appropriate, and Errhines of *Nicotiana* inappropriate, because this latter article is Narcotic. He says very safely, "they are employed in" not that they cure "various diseases of the head, eyes and teeth." Out of Pearson's nine Errhines, he thinks that two may be dispensed-with; one is superfluous; one is just about good for nothing; two are almost too virulent to be employed; and we have three remaining; and he might have added that two of these are never employed. In the U. S. A. I believe they are utterly unknown; so that *Nicotiana* is all that remains. Of this he says its ordinary use is disgusting, and its excessive use injurious to the health. I wish that Dr. Pearson had defined what excess is, for I never yet found the person who admitted that he used it to excess, or that health was injured by it. All who employ *Nicotiana* to excess and have injured their health by it always live a great way off, and I never went in search of them.

J. Moore Neligan says "Errhines are substances which, when applied directly to the lining membrane of the nostrils, cause an increased discharge of its natural secretion." (*J. Moore Neligan*

Med. Uses and Mode of Administration, 2d Edit. *Dubl. and Lond.* 1847, *Pg.* 201.) This is essentially a correct definition. My own differs from this only in the addition of a few particulars, all of which (except Sternutation, which however, is not essential) may be fairly inferred. I think that Neligan's is the best definition with which I have met in any author. Neligan has but four Errhines, viz. *Asarum Europæum*, *Euphorbium*, *Hydrargyri Oxydum Sulphuricum*, and *Veratrum album*. It is surprising to me that so few articles of this class are mentioned by authors. Neligan's list would answer very imperfectly for the U. S. A. since I never could find *Asarum Europæum* or *Euphorbia officinarum* in any shop within my knowledge; and all the *Veratrum album* of which I have ever made trial, has been very nearly worthless, either from age merely, or from long keeping in powder. If it is worth while to have such a class at all, it is also worth while to give a larger catalogue of articles belonging to it, since there is a large number possessing this power.

It may perhaps be questioned whether there is any proper foundation for the class of Errhines, since they are merely topical Blennagogues. They however prove Blennagogue in a manner intirely different from that in which the Blennagogues heretofore treated-of are supposed to do. As will be recollected, the true and proper Blennagogues are taken into the alimentary canal and make their first impression upon its inner parietes, (as I believe) never being brought into contact with the mucous follicles, but affecting them through the medium of some part of the nervous system. They are commonly supposed to render benefit by the increased secretion which they produce. The Errhines on the other hand, operate to increase the secretory activity of the mucous follicles by actual contact with their excretories and the membrane in which they terminate and (as far as I am acquainted with prevalent professional opinion in the U. S. A.) are commonly supposed to benefit rather by the topical irritation which they occasion, than by the discharge which they produce. I have often heard their supposed effect compared to a *Fonticulus* or *Issue* and a *Setaceum* or *Seton*. However, I believe it is questioned whether even these do not benefit more or less by the discharge which they produce, as well as by the topical irritation which they occasion.

The Errhines seem to produce increased secretory activity of the mucous follicles by an actual and positive irritation of their ducts and of the membrane in which they terminate, and this, by virtue of a true and proper Sub-Oresthetic or Irritant (not Antie-bestic) power in the agent employed, while no such Sub-Oresthetic or Irritant power is at all necessary to the Blennagogues heretofore treated-of. This class may therefore be considered as certainly founded upon quite a different power from that on which Blennagogues are based, though the effect of both powers may be Blennagogue in senses of which the etymology of the term certainly admits. Some Errhines produce an increased quantity of thin mucus merely; others produce an increased quantity of acrimucus i. e. a substance as near to serum as mucus; while others still occasion a mucipurulent or even purulent excretion, some times of long duration. Some Errhines occasion violent and protracted Sneezing; others only a moderate degree of it; while others still produce but very little of it. Some produce this effect when first employed, but cease to produce it after being used for a short time. Sternutation or Sneezing is not commonly supposed to contribute any thing to the medicinal effects of the Errhines. In all probability, the topical irritation occasioned in the Schneide-rian membrane is the operation by which their supposed benefit is produced. If this is correct, it assimilates this class to the Oresthetica; and this is undoubtedly the class with which the Errhines have the greatest analogy. It is possible but not very probable, that Sternutation or the act of Sneezing may, by its concussion, prove slightly counter-irritant. But many ascribe their benefit to the discharge of thin mucus which they occasion. If this is correct, it assimilates them to the Blennagogues. It is possible, but not very probable, that Sternutation or the act of Sneezing may, by its concussion, slightly increase the activity of the secernent and absorbent or glandular system. The greater tendency of some Errhines than others to produce Sternutation, does not depend upon any greater degree of acrimony, or any greater degree of Stimulant power, as Cullen supposes, but upon some other peculiar quality, intirely independent of acrimony, and equally independent of Stimulant power. On the whole, it appears to me to be altogether the most probable that what little medicinal effect the Errhines ever produce, is occasioned by the

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no sort of connection with Stimulus in the legitimate sense of this term, and scarcely any with an Oresthetic operation. Some of the most powerful Sternutatories (using this term in the sense of articles that produce Sneezing merely,) are neither stimulant, nor even acrid without being Stimulant, as Diprotosulphate of Mercury for example. I have seen powerful Sneezing from finely pulverized Loaf-Sugar. This is assuredly neither Stimulant nor an Acrid-Oresthetic. Cullen specifies only six Errhines, only one of which in its dry state, is naturally acrid. To Cullen's list B. S. Barton adds three more, neither of which, in the dry state, are materially acrid.

John Murray says that "Errhines or Sternutatories are substances which occasion a discharge from the nostrils, of a mucous or serous fluid." *J. Murr. Syst. Mat. Med. and Pharm. Fr. 4th. Edinb. Edit. N. Y., 1828, by J. B. Beck, Vol. I. Pg. 241.* Murray's definition has exactly the same deficiency as Cullen's, and the same objections may therefore be made to it, which it is not necessary to repeat. It ought however, to be added that this deficiency is supplied in the subsequent remarks, though it ought to have been embodied in the definition, since Murray says at last that "Errhines operate by direct application, and generally in consequence of a slight acrid quality." He adds however, "any substance in fine powder snuffed-up the nostrils has this effect in a certain degree; but as is to be expected, it is more copious as the substance is more acrid or Stimulating." "The discharge as produced by different Errhines, varies in extent, and in the time during which it continues." "Some also occasion a sense of heat, or even inflame the membrane to which they are applied, while others have no such effects." (*Ibidem.*)

As the subject of the necessity of acrimony to an Errhine is here mentioned for the first time, it may as well be disposed of in this place, as later in the proëm, more especially as little need be said about it. Some Errhines are acrid, but acrimony is not necessary to an Errhine power, since there are many non-acrid as well as acrid ones well known and employed. Those articles possessing that sort of acrimony that has a strong tendency to produce Erythematic Phlogosis in delicate textures should always be avoided as Errhines, since Phlogosis is incompatible with increased secretory activity of the mucous follicles, except secondarily, and

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The synonymy of this class is by no means extensive. It is some times called *Ptarmica*, which is an ancient and classical Greek term, the feminine gender of an attribute signifying "que Sternutare potest vel solet; Sternutamenta movens; cui vis inest sternutamenta movendi;" (*Hedericus*) "that provokes Sneezing; Sternutatory." (*Donnegan*.) A noun-substantive of the same orthography is the name of a genus in botany, so called because the typical species, viz. *Ptarmica vulgaris* (*De Candolle*) is an ancient Errhine or Sternutatory. Both the noun-adjective and the noun-substantive are derived from an ancient Greek verb signifying *Sternuo* i. e. *to sneeze*. The term *Ptarmica* is objectionable on the score of signification, since Sneezing is by no means an invariable effect of this class of agents; and when it actually takes place, it is not the essential effect, that by which these articles render the service usually attributed to them. In fact, the act of Sneezing contributes nothing at all to the supposed medicinal effects of this class; and it is obvious that no class should be named from an effect which is not medicinal.

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It is sometimes called *Apophlegmatica*, a legitimately formed term from an ancient Greek verb signifying to promote the excretion of phlegm or mucus. Though this term is Greek and legitimately formed, yet its intrinsic or etymological signification is more applicable to the Blennagogues than to the Errhines. There is nothing in its signification to indicate that it produces its effect by topical irritation instead of reception into the stomach and operating through the medium of certain parts of the nervous system. It is true a term can not be expected to express a complete and perfect definition; but two terms of the same intrinsic import should not be made so different by a definition merely. For these reasons I think that this term should be wholly rejected from the materia medica. But Cullen gives a wider and much less definite sense to this term, and one in which I never happened to hear it employed in recent times, though it was so used anciently. Cullen says that *Apophlegmatica* are "medicines suited to excite the excretion of mucus from the Schneiderian membrane; and they are of two kinds; as the evacuation is made from the nose, when they are called Errhines, or as the same is made from the mouth, when they are named *Masticatories*. (*Cull. Treat. Mat. Med. B. S. Bart. Edit. Philad.* 1812, Vol. 1, Pg. 114.) In this definition this term is not limited to effects produced by topical application to the nostrils, but would comprehend any of the Blennagogues provided they only increase the secretion of mucus from the Schneiderian membrane, whether they increased it from any other mucous membrane or not. Such a term with such an application can not be admitted into such a classification as mine. But Cullen makes this term comprehend also, articles which increase the secretion from the mucous follicles of the mouth, whether this is accomplished by articles taken into the stomach or topically applied. Now I have no knowledge that there are any articles that accomplish this by being taken into the stomach; and all those that accomplish it by topical application, as would seem, increase the secretion of saliva in a much greater degree; so that this extension of the term would comprise all the Sialogogues commonly so called which act by

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topical irritation which they occasion, or in another word, the counter-irritation. Others still entertain the opinion that the supposed benefit of the Errhines results from the joint effects of the topical irritation and the discharge.

There are certain non-evacuant powers of the *materia medica* which even by very limited topical application of the articles possessing them to highly susceptible parts, are capable of affecting the whole system. If any article used as an Errhine possesses one of these powers, its employment in that way of course produces constitutional effects. A Narcotic power is one of these. It is well known that the system may be Narcotized by *Nicotiana Tabacum* used as an Errhine. A Euphrenic power is another. It is solely for its Euphrenic effect that Tobacco is so commonly employed as an Errhine; and it is the production of this effect which has occasioned Tobacco to be preferred to every other article commonly used as an Errhine. If Tobacco were to be rejected as an Errhine, what is commonly called Snuff-taking would soon go intirely out of fashion. Not but what there are other Euphrenics which might be employed in the same way, with the same effects; but none of these are sufficiently well known to the public, to have come into use for this purpose. But these are no part of true and proper Errhine effects; and this is never an eligible method of employing Narcotics, Euphrenics, etc. These classes of medicines are always far better taken into the stomach, with the exception of the *Æthers* in certain cases. What would be thought of the judgment of the practitioner who should administer Opium, Coca, Guaraná, etc. by the nostrils after the manner of the Errhines. This might perhaps be as judicious as administering the salts of the Oxyd of Quininum in solution by way of injection into the urinary bladder, which was gravely recommended not a long time ago, by a medical gentleman, as preferable to taking it into the stomach.

It will be recollected that my classes are founded on different and distinct powers, and on these merely. The essence of the operation of an Errhine is Sternutation and an increase merely of the secretory activity of the mucous follicles of the Schneiderian membrane, without augmentation or diminution of power, energy or strength of action, and this produced by a topical application of the Errhine to the Schneiderian membrane itself. In all

probability, a topical Irritation of the Schneiderian membrane may in some instances be full as important as the increased secretion or the Sneezing; but all Errhines do not produce such an effect in any manner capable of proving counter-irritant of any disease. For the production of Sternutation the Errhines must exert their primary influence upon the nerves of common sensation which are sent to the Schneiderian membrane. For the production of increased secretion they must of course exert their primary influence upon that part of the involuntary motor nerve of chemical action, nutrition, etc., which is sent to the mucous follicles of the Schneiderian membrane. As counter-irritants they must exert their influence upon the nerves of common sensation that are sent to the lining membrane of the nostrils. There is no probability that the Errhines ever produce any medicinal effects through the medium of the olfactory nerves; nor are these nerves at all affected by any Errhines except odorous ones, and by these not usefully.

The synonymy of this class is by no means extensive. It is some times called *Ptarmica*, which is an ancient and classical Greek term, the feminine gender of an attribute signifying "qui Sternutare potest vel solet; Sternutamenta movens; cui vis inest sternutamenta movendi;" (*Hedericus*) "that provokes Sneezing; Sternutatory." (*Donnegan*.) A noun-substantive of the same orthography is the name of a genus in botany, so called because the typical species, viz. *Ptarmica vulgaris* (*De Candolle*) is an ancient Errhine or Sternutatory. Both the noun-adjective and the noun-substantive are derived from an ancient Greek verb signifying *Sternuo* i. e. *to sneeze*. The term *Ptarmica* is objectionable on the score of signification, since Sneezing is by no means an invariable effect of this class of agents; and when it actually takes place, it is not the essential effect, that by which these articles render the service usually attributed to them. In fact, the act of Sneezing contributes nothing at all to the supposed medicinal effects of this class; and it is obvious that no class should be named from an effect which is not medicinal.

Sternutatoria derived from the Latin verb *Sternuto*, i. e. *to sneeze frequently*, is another name that has been applied to this class. This is exactly equivalent in signification to *Ptarmica* and is subject to all the objections that have been suggested in reference to that

term, with the additional one that it is Latin. Upon my plan of nomenclature for the classes, and even upon that commonly received, this term is inadmissible.

It is sometimes called *Apophlegmatica*, a legitimately formed term from an ancient Greek verb signifying to promote the excretion of phlegm or mucus. Though this term is Greek and legitimately formed, yet its intrinsic or etymological signification is more applicable to the Blennagogues than to the Errhines. There is nothing in its signification to indicate that it produces its effect by topical irritation instead of reception into the stomach and operating through the medium of certain parts of the nervous system. It is true a term can not be expected to express a complete and perfect definition; but two terms of the same intrinsic import should not be made so different by a definition merely. For these reasons I think that this term should be wholly rejected from the materia medica. But Cullen gives a wider and much less definite sense to this term, and one in which I never happened to hear it employed in recent times, though it was so used anciently. Cullen says that *Apophlegmatica* are "medicines suited to excite the excretion of mucus from the Schneiderian membrane; and they are of two kinds; as the evacuation is made from the nose, when they are called Errhines, or as the same is made from the mouth, when they are named *Masticatories*. (*Cull. Treat. Mat. Med. B. S. Bart. Edit. Philad. 1812, Vol. 1, Pg. 114.*) In this definition this term is not limited to effects produced by topical application to the nostrils, but would comprehend any of the Blennagogues provided they only increase the secretion of mucus from the Schneiderian membrane, whether they increased it from any other mucous membrane or not. Such a term with such an application can not be admitted into such a classification as mine. But Cullen makes this term comprehend also, articles which increase the secretion from the mucous follicles of the mouth, whether this is accomplished by articles taken into the stomach or topically applied. Now I have no knowledge that there are any articles that accomplish this by being taken into the stomach; and all those that accomplish it by topical application, as would seem, increase the secretion of saliva in a much greater degree; so that this extension of the term would comprise all the Sialogogues commonly so called which act by

topical application, and probably all that produce that effect by being taken into the stomach. Such an extension of the application of this term causes it to comprise several of my classes, and renders it valueless for all the purposes of exact and correct classification.

This class is some times called *Apophlegmatizonta*. This term is merely one of the tenses of the participial mode of the Greek verb from which *Apophlegmatica* is derived, imperfectly spelled in Roman letters. There is no other term analogous to this among the names of the classes of the *materia medica*. I think it ought to be rejected, not only on account of its grammatical character, but from its signification.

It is also occasionally called *Apophlegmatizantia*. This is a very singular term grammatically. If the Greek verb from which the term *Apophlegmatica* is derived were to be inflected after the manner of the first conjugation of Latin verbs, the present tense of the participial mode of the active voice, plural number, neuter gender, the nominative, accusative and vocative cases would be *Apophlegmatizantia*. I believe that the Romans did occasionally adopt Greek verbs and inflect them according to the laws of the Latin language; but *Apöphlëgmatiszō* is not to be found in the Latin Dictionaries, though *Apöphlëgmatismus* is, and is marked with the sign that it is Greek and not Latin. The signification of this last term is "*medicamentum quod pituitam per os ex capite aut thorace educit; or a medicine to purge the head and pectoral parts of phlegm.*" (*Thomas De Sacra-Quercu, i. e. Thomas Holyoak*), whose Latin Dictionary contains more out-of-the-way terms than any other. These last two terms have essentially the same etymological signification as *Apophlegmatica*, and Cullen by definition gives them the same latitude of application. They appear to me to be objectionable in every point of view.

By what power or operation are Errhines supposed to relieve disease? "This evacuation" says Cullen, "not only empties, but also produces a large excretion from the mucous follicles of the Schneiderian membrane; but agreeable to the laws of the circulation, this must produce an afflux of fluids from the neighboring vessels, and in some measure empty these." "By this it often relieves Rheumatic Congestions in the neighboring muscles, and

particularly those in which the Tooth-ache often consists." (*Cull. Treat. Mat. Med. B. S. Bart. Edit. Philad. 1812, Vol. II, Pg. 303.*) "But not only the more nearly adjoining vessels are thus relieved, but the effects may extend further to the whole of the branches of the external carotid; and we have known instances of Head-ache, Ear-ache and Ophthalmia cured or relieved by the use of Errhines." How far their effects may extend, can not be exactly determined; but it is probable that they may operate more or less on the whole vessels of the head, as even a branch of the internal carotid passes into the nose; and independent of this, it is not improbable that our Errhines may have been of use in preventing Apoplexy and Palsy; which at least is to be attended-to so far, that whenever any approach to these diseases is suspected, the drying-up of the mucous discharge should be attended-to and if possible, restored." (*Ibidem, Pg. 303-4.*)

By these remarks, Cullen very evidently supposes that Errhines prove remedial by what has been called derivation and revulsion. As appears to me, this is wholly an unproved hypothesis, one in which I at least have no degree of belief. I have no knowledge of what Cullen intends by Rheumatic congestion in any parts at all contiguous to the nostrils. Rheumatismus which is normally an articular Phlogoticum, and is attended with a Phlogotic congestion, never affects any of these parts; and Rheumatalgia, which is evidently here intended is a pure Neuroticum, having no congestion whatever. Rheumatalgia has its normal seat in nerves of common sensation sent to muscles. In what muscles Cullen could suppose Odontalgia or Tooth-ache to have its seat, I can not possibly imagine. I did not suspect that any physiologist and pathologist could assign any other seat to this disease than the nerves of common sensation sent to the aching tooth or teeth. I know of no reason to believe that the relative distribution of the blood has any connexion with Neuralgia of any sort; and all idiopathic Head-ache, Ear-ache and Tooth-ache are certainly Neuralgia. As to Ophthalmitis, that is certainly a Phlogoticum, and as such has a Phlogotic congestion; but I utterly deny the power of any Errhine to obviate it. I am satisfied that no single proof of any such operation can possibly be adduced. I do not think that the fact that a branch of the internal carotid passes into the nose, contributes a par-

ticle to prove or even favor the hypothesis now under consideration.

I have never yet met with the least reason to conclude that any Errhine was ever instrumental in preventing Apoplexy or Palsy (Apoplexy is Palsy of the hemispheres of the cerebrum) and till such evidence is adduced I shall keep my faith in abeyance. I have long been well satisfied that the suspension of a Blennorrhœa nasalis never contributes a particle to the production of an Apoplexy; though I do not entertain a doubt that the commencement of an Apoplexy, and much more the occurrence of the perfect disease will suspend a Blennorrhœa nasalis. In this, and numerous analogous cases, the effect is regularly mistaken for the cause. More accurate observations will invariably correct this error. Cullen says that "the evacuation often goes no further than to restore the natural evacuation when it has been interrupted; but it commonly goes further, and increases the evacuation beyond its usual measure; and that not only for some time after the medicine has been applied, but also for some following days." (*Ibidem*, Pg. 303.) There is indeed, every grade or degree of Errhine effect from the mere restoration of the secretion of mucus to its natural state when the mucons follicles had been previously torpid and inactive, to the most profuse secretion that can ever be made to take place. But the natural secretion from the Schneiderian membrane is barely sufficient to moisten and lubricate it, and therefore is perceptible in no other way than by performing this office. Assuredly this can not rightly be called an evacuation; and how can the restoration of a natural secretion be productive of any derivation and revulsion? And yet, as a dry state of such a membrane might be disagreeable or even inconvenient, it may be of some service to remedy such dryness, (if indeed it ever happens) though not in the way which Cullen supposes, i. e. by producing a derivation and revulsion.

Errhines, like every thing else in the materia medica, have been, and still are said to operate by Stimulation. After his definition and explanation, Cullen adds—"these are the effects of an increased discharge from the nose; and we are to say next how they are to be obtained, which is to be done by Stimulants applied to the internal surface of the nose; and I have set down a list of such as may be employed." "These differ only by the degree of

acrimony which they possess; and I have endeavored to arrange them accordingly; but I could not possibly do this with much accuracy." (*Ibidem*, Pg. 304.)

Of the six Errhines mentioned by Cullen, not one of them is ever used for the production of "a quickly diffused and transient increase of vital energy and strength of action in the sanguiferous system," or any other subordinate part of the animal economy; and according to the best knowledge which we possess, not one of them is capable of producing any such effect. Of these *Majorana hortensis* (*Moench.*) is one. It is possible that its Essential Oil in its separate state might be capable of proving truly Stimulant i. e. Antisbestic, since some of the Essential Oils have this power, but it is not known to have it, and the amount of its Oresthetic power renders it improbable, intense vegetable Oresthetics rarely being Antisbestic. It may be considered as quite certain that the dry plant in powder is destitute of it; and if it were not, it never could produce such an effect, by what little could be snuffed into the nostrils. In this case, as in several others already specified, medical writers and practitioners do not distinguish between mere impression and the production of new action and condition; mere topical irritation and increased secretory activity; and increased vital energy and augmented strength of action. These are indeed very different things, altogether too different to be thus confounded. It may be considered as quite certain that the first two do not by any means imply the last. In fact, that degree and quality of the first two, which is either the effect of a medicinal agent, or the result of disease, appears to be incompatible with the last. But all this I have heretofore repeatedly inculcated in different connexions and in different words. Stimulation in its proper and legitimate acceptation, has no connexion either with Sternutation or increased secretory activity of the mucous follicles. Notwithstanding Errhines are so commonly said to operate by Stimulation, no body seems to have considered this view as at all incompatible with the opinion that they prove remedial by means of the increased secretion and evacuation which they occasion; and yet true and proper Stimulants are never evacnants; nor do evacnants ever directly increase vital energy and strength of action in any subordinate part of the human system. As appears to me, the opinion that Errhines ope-

rate by Stimulation is equally incompatible with the view that they render service by their topical irritation, since pure Stimulants (in the sense of Antisbestics) are never counter-irritants. Even *Cantharis vesicatoria* which possesses a moderate Antisbestic power along with an active Oresthetic one ceases to act as an Antisbestic as soon as it begins to produce that degree of an Oresthetic effect, which is capable of proving counter-irritant.

"By the evacuation which they occasion" (says J. Murray) "it has been supposed that Errhines diminish the quantity of fluid circulating in the neighboring vessels; hence they have been inferred to be useful in Rheumatic affections of the muscles of these parts; and in Tooth-ache. (*J. Murr. Syst. Mat. Med. and Pharm. Fr. 4th Edinb. Edit. N. Y. 1828, by J. B. Beck. Vol. 1, Pg. 241-2.*) J. Murray says—"it has even been supposed that their effects may extend to all the branches of the external carotid; and Dr. Cullen mentions that, apparently from this operation, he has known Head-ache, Ear-ache, and some cases of Ophthalmitis cured or relieved by the use of Errhines." "He has likewise supposed that they may have been of use in preventing Apoplexy or Palsy." He remarks that "this should at least be so far attended-to that when any approach of this disease is suspected, the drying of the mucous discharge should be attended-to, and if possible obviated. (*Ibidem, Pg. 242.*)

Nelligan expressly says "the remedial powers of Errhines depend on the derivation which they occasion from the surrounding or neighboring parts, by the increased secretion from, and consequent afflux of blood to the nasal membrane." (*Nelligan Mat. Med. 2d Edit. Dubl. & Lond. 1847, Pg. 201.*) Here again is the doctrine of derivation and revulsion. The comparison of the effects of the Errhines to the effects of Fonticuli and Setacea does not throw much light upon the subject of the manner in which they render their supposed benefits, since it is quite as much of a question whether these are of service by their topical irritation, i. e. their counter-irritation, or by the discharge which they produce. Some of those at least who ascribe the benefits of Fonticuli and Setacea to the discharge which they produce, explain it upon the hypothetical principle of derivation and revulsion; for the ghost of this hypothesis still stalks about the medical world, though it has been exorcised and laid, full a hundred times; and this expla-

nation has been applied to the Errhines by those who ascribe their supposed medicinal effects to the discharge which they produce. For myself, I have never been able to find the least evidence, from observations upon the sick and valetudinary, of any just foundation for the hypothesis of derivation and revulsion.

The following is a note from a lecture of a distinguished living American professor. "Though I am not disposed to deny that fluids may be translated, yet I contend that the principal effect produced by Errhines does not depend upon the translation of fluids, but the translation of action and irritation." "I infer this from two facts; First, that simple Cupping, which is attended with no evacuation, relieves similar complaints; and also, Second, that Mustard applied to the skin relieves similar diseases when no evacuation has been produced." "The complaints which Dr. Cullen mentions in support of the theory" (by no means a theory—it is a mere speculation) "of the translation of fluids by Errhines, do not depend upon congestion but irritation, and this irritation is removed by counter-irritation." For my own part, I am not only disposed, but perfectly ready to deny positively that the fluids of a diseased part are ever translated to another and healthy part, and much more especially when there is no direct connexion between the vessels of such parts. Did this distinguished gentleman mean to say that the identical morbid action of a diseased part ever is, or can by any possibility be removed, transferred or translated unchanged from the part in which it first occurs, to any other previously healthy part? As appears to me, the language employed very unequivocally and very clearly expresses this. If there is no mistake here, I must say that I utterly dissent from this gentleman's opinion. Strictly speaking, metastasis or translation implies the removal of some individual and identical thing, or at least attribute or quality, from one place or part to another, which never happens in disease, or in any thing connected with it. The terms derivation and revulsion really imply very much the same thing, and are equally impossible. Even in Podagra, Rheumatismus and perhaps Rheumatalgia, which are commonly called metastatic or translatable diseases, there is in reality no metastasis or translation. In these examples, the topical affection of a constitutional disease is suspended in one part, and a new topical affection begins in another part. The suspension of the disease in

its first situation is by no means necessary to its occurring in a second ; for we often find it in two, three or four places at once. But in what is called counter-irritation, no body ever really supposed that the action produced by the counter-irritant is the same as that of the disease for which it is employed ; and can any body, at this late day, seriously believe in derivation and revulsion, which imply the removal of the action of disease from the part in which it began, to a part to which a counter-irritant (so called) has been applied ; and that in such cases the counter-irritant does not produce its own peculiar and specific action, that which it would occasion upon a person in health, but instead of this, a literal translation of the morbid action of the disease to the place of the application of the counter-irritant ? If I had not personally heard these last mentioned views seriously maintained, I could not have believed that they had ever had advocates, and much less that they could possibly have advocates at the present period. Even now, I can not believe that the distinguished men, with whom the speculation of derivation and revulsion originated, ever entertained any other notions in regard to the subject, than are now entertained in regard to counter-irritation. And yet, the language clearly implies what appears to me so incredible ; and from the concluding sentence of the quotation just made, I should suppose that such must be considered as the explanation even of a counter-irritation, at least in the view of the advocates of derivation and revulsion.

J. Murray says that "it is evident that the effects of this class of remedies must be very limited as applied to the treatment of disease." (*J. Murr. Syst. Mat. Med. and Pharm. Fr. 4th Edinb. Edit. N. Y. 1828, by J. B. Beck, Vol. 1, Pg. 241.*) In this opinion I concur fully and intirely.

"Errhines," says Richard Pearson, "are employed in various diseases of the head, eyes and teeth." (*Rich. Pears. Prac. Synops. Mat. Aliment. and Mat. Med. Lond. 1808, Pg. 119.*) This is having the therapeutic application of the Errhines in a very vague state, since there are very numerous diseases of the head, eyes and teeth, in all of which it can not be supposed that the Errhines can possibly be useful. What would be thought of the use of Errhines in Cephalitis Caumatodes-Phlegmonea, i. e. Entonic Phlegmonous Phlogosis of all the textures of the brain,

the constitutional Febrile affection being a Cauma or Synocha? This is a disease of the head.

Neligan says that "the medicinal employment of Errhines is very limited; and in the present day they are seldom resorted-to in regular practice." (*Neligan Mat. Med. 2d Edit. Dubl. and Lond. 1847, Pg. 201.*) Their use is indeed so limited that during my whole professional life, I never knew them prescribed in a single instance, except as a placebo, and very rarely even for this purpose. Neligan says—"snuffed into the nostrils so as to occasion Sneezing, Errhines may be employed to Excite respiration when this function is suspended, or to promote the expulsion of foreign bodies lodged in the air passages." "Their use for this purpose however is not unattended with danger." (*Ibidem.*) The word Excite is even more vague than the word Stimulate, since beside being used in all the senses of Stimulate it is also used in the sense of *produce*; *occasion*, etc. As employed here it probably means *produce*; or *restore*. But when respiration is suspended, who would feel justified in relying upon Errhines for its restoration? In all cases except a mere momentary suspension, factitious respiration ought to be immediately resorted-to, and nothing without this ought to be at all confided in. Suppose respiration is suspended by inoculation with Curarina or Curarine. In such circumstances, is not death certain, unless factitious respiration is kept-up till the effects of this Narcotic have passed-off? Is not the same equally true of respiration suspended by Cyanid of Hydrogen, Emphyrenumatic Essential Oil of Nicotiana, Benzhydrid of Hydrogen, Papaver, etc.? What sort of cases Neligan here refers-to I can not determine, unless it may be suspension of respiration from submersion in water, Carbonic Acid or other irrespirable gasses. When respiration is suspended the only way by which an Errhine can well be got into the nostrils is for another person to blow it in by means of a tube, a quill for example. Now I never saw this practised, and therefore can not tell what may be accomplished by it; but a priori I should expect that the Schneiderian membrane would be wholly insusceptible to the impression of all ordinary Errhines under such circumstances. I have no ground therefore, for commending Errhines in such cases.

But what are the diseases specified by authors generally, in which Errhines are supposed to be capable of rendering service? They

ployed as remedial agents, and are they now ever prescribed? I think the answer of every physician will be in the negative.

But Tobacco-Snuff may perhaps be mentioned as an Errhine in common use. It is true that this article is an Errhine which is very often employed, and that by multitudes; but it is not at all used for its Errhine effects, but for its Euphrenic operation and perhaps to a small extent for its Narcotic effect, since it is one of the few articles that is capable of affecting the constitution by very limited topical application. We must not therefore reckon it as producing the effect of an Errhine, in its habitual use. Though it may be useful when taken in this way for its Euphrenic effects; yet this effect may be far better produced in some other way, and therefore we can not commend Tobacco-Snuff for this purpose.

The habit of using Tobacco Snuff can not be too strongly disapproved. At best it is a troublesome and highly offensive, and therefore an ungentlemanly custom. Sooner or later, it inevitably injures the voice; blunts the sense of smell; causes a constant thirst which water will not allay; and by keeping up a constant preternatural discharge from the Schneiderian membrane, is attended with all the effects (whatever they may be) of a useless Issue. In addition to this, it is generally believed by physicians to operate injuriously to a greater or less extent upon the organs of primary digestion. In some subjects it is said some times to produce Limosis Anorexia, Limosis Cardialgia, Limosis sputatoria or Limosis Syncoptica, and even other species or varieties of Limosis. I have certainly often known Limosis Syncoptica produced by it; and I have known the rest to occur in Tobacco-Snuff-takers, as I have in various others. I have often heard it alleged to produce Parabysma Pancreatis, Parabysma Liënis and Parabysma Jecinoris; but I never met with the least evidence of this, and I do not believe it. According to common professional opinion Tobacco-Snuff is one of the worst articles to employ after the manner of an Errhine, because, as Dr. Good says, it "operates with the mischief of a Narcotic, as well as of a Stimulant" (by which last term, we must understand a topical irritant, and nothing more nor less) "and hence the copious and foul distillation with which the nostrils of aged Snuff-takers are deformed." I give the quotation for what is worth; and I am convinced that the offensiveness of

are Paralysis Apoplexia, but which species we are not told, though there are assuredly three, which are certainly quite distinct, never passing into each other, viz. Paralysis Apoplexia-Sanguinea, Paralysis Apoplexia-Serosa, and Paralysis Apoplexia-pura, the latter often called nervosa and cerebialis. Errhines are likewise commended as prophylactics of Apoplexy; Paropsis Amaurosis; Paraculis obtusa; Neuralgia Capitis, of which there are at least two distinct species; Neuralgia Auris, of which there are also two species; Neuralgia Dentium, of which there are three species; some disease (I know not what) which is vaguely called Rheumatic Congestion, and Ophthalmitis, of which there are several quite distinct species requiring a considerable diversity of treatment. Now who would repose the least confidence in any Errhine now known for the relief of either of these three species of Apoplexia; who ever would think of prescribing any one of them in either of these diseases; indeed who would not rather apprehend aggravation from the act of Sternutation, provided it should be produced? As prophylactics of Apoplexia it seems to me that even less (if there can be supposed to be any thing less than nothing at all) is to be expected from Errhines, than as remedies. If any confidence is to be reposed in the testimony of non-professional bystanders, patients have fallen-down Apoplectic during the act of Sneezing, a thing far more probable, as appears to me, than that Errhines should prevent this disease. Who ever knew a case of true Amaurosis benefited, or much more, cured by Errhines? Who ever knew partial Deafness relieved or cured by them? The same question may be asked triumphantly, and without the least probability of an affirmative reply, in regard to the several species of Neuralgia which have been specified. Perhaps Rheumatic Neuralgia of the nose (if there were only any such disease) might be cured by Errhines. As to Rheumatic Congestions any where in the neighborhood of the nose, I trust I may be excused from saying any thing of them, till I am assured of their existence. Who ever prescribed the Errhines in any species of Ophthalmitis, and in what species is there the least probability that they would benefit? If Errhines were to be struck from the materia medica, would any practitioner of medicine ever miss them? In short, do they now *de facto* belong to the materia medica; or in other words, are they capable of being usefully em-

ployed as remedial agents, and are they now ever prescribed? I think the answer of every physician will be in the negative.

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the custom to others is not at all exaggerated. For myself however, I have no knowledge that there are any peculiar mischiefs from the Narcotics as Narcotics merely. The Limosis Syncopica which results from the habitual and protracted use of Tobacco, Poppy, Wine and Alcohol I am quite sure is occasioned by the Euphrenic power of these articles, and not by their Narcotic power.

The suspension of a protracted habit of Tobacco-Snuff-taking is said some times to produce Head-ache, various disorders of the eyes, and other similar disturbances, the same, it is declared, result from the sudden suspension of an old Issue; and the formation of an Issue is of course recommended as the remedy. I have never seen any thing of all this, though I have witnessed abundance of Tobacco-Snuff-taking; and I must confess myself intirely incredulous of the whole of it.

But if Errhines are so absolutely worthless, it may perhaps be inquired why I retain them? I answer because they are found in nearly all the works on the materia medica, and the innovation of leaving them out will be deemed by many too great to be tolerated. As an instructor in a public institution I tried the experiment several times, but it would not do. I was asked my reasons for the omission, and about as much explanation was required as the amount of this proëm. In the same manner I endeavored to drop the Anthelmintics, the Antidotes and the Antilithics; but a disquisition upon each was insisted-on. It was not deemed sufficient to say that neither of these classes was founded upon a single power, but upon several, every one of which was the foundation of some other class. I must give a regular proëm to each, though the whole three were spurious classes. In the present case I have concluded not to afford ground for any one to say that a true class is omitted. But though the class may be admitted to be worthless, I hope it will not be altogether useless to consider the grounds on which this conclusion rests.

PROËM TO THE CLASS ESSTOMATICA.

The term Esstomatica is derived from a Greek preposition signifying *in*, and a Greek noun-substantive signifying *mouth*, being so called because they are taken into, and retained in the mouth, instead of being swallowed, and therefore produce all their effects by mere topical application to this cavity. The final letter of the preposition is changed to the initial of the noun-substantive, according to a well known law of combination in the Latin language, which may be illustrated by such words as *superposition* made-up of the preposition *sub* and the noun-substantive *positio*; *application* made-up of the preposition *ad*, and the noun-substantive *plicatio*; and perhaps hundreds of other instances might easily be specified. As I have already said of Errhines, it is contrary to all principle to name a class in the *materia medica* from the part to which the medicine is applied; but I retain the term Errhine in application to the last class because I could not devise one that suited me better; and because exceptionable as it is, it is in general use; I now therefore employ an analogous term for the class of which I am now treating, because the class is analogous, perhaps I should say identical; and because I can not devise one that suits me better. I can not retain the name Sialagogue by which it is called in the books, because that term is now employed, and in fact required, for a different and distinct operation, produced by a different and distinct power, and by medicines not applied in the same manner; and because a class can not with any propriety be named from a non-medicinal power and operation, which is certainly the character of the effect on which the term Sialagogue is founded. The last class, named in analogy with this, was almost too unimportant to be retained in the *materia medica*, so that I could not but anticipate the possibility of its ultimate rejection—a fact which rendered its name of less importance. The class that I am now considering has a somewhat better foundation, and is of somewhat more importance, and is somewhat more likely to be retained. The power on which the two classes are founded, the manner of the employment of the articles belonging to each, and their operation and effects are so nearly identical, that if they are to be retained in the *materia medica*, as appears to me, they should be retained only as a sin-

gle class, with an appropriate denomination equally applicable to both and including both. According to the definition which I adopt, the two classes are made up of the same articles. All my Errhines would be equally Esstomatics, and all my Esstomatics would be equally Errhines. I certainly should have united them and reckoned them as a single individual class, except from inability to devise a suitable appellation. I am confident that I have somewhere met with this arrangement, though without a classical name; but I can not now recollect where. I think that this will be the method finally adopted by those writers on *materia medica* who have formal classification; and probably by those who have only an informal one, for the *materia medica* can not possibly be treated of without a classification either expressed or implied.

Definition. Esstomatica are articles which by direct topical application to the mouth directly increase the secretory activity of the salivary glands, and doubtless also of the mucous follicles of this cavity, and as would seem, by an influence exerted upon the excretory ducts and thence propagated to the glands themselves.

It will at once be perceived that this definition is not equivalent to that of Sialagogue or Ptyalagogue, but is intended to exclude that disproportionate operation upon the Salivary glands which is produced by the Mercurials, and not infrequently by numerous Adenagics, when they are taken into the stomach. The Sialagogue-Adenagics produce their effects by an entirely different power, employed in a totally different manner; and of course they can not with the least propriety be associated with the Esstomatics. Let it be particularly noticed that the effects of the Esstomatics are never produced in any other manner than by masticating the Esstomatic agent, or by holding in the mouth some liquid preparation of it made of sufficient strength.

The primary operation of the Esstomatics is exerted upon that part of the involuntary motor nerve of chymical action, nutrition and reproduction which is sent to the Salivary glands, and doubtless also upon that which is sent to the mucous follicles of the mouth. The essence of the operation of the Esstomatics seems to be a mere increase of secretory activity in the Salivary glands, and mucous follicles of the mouth, without any augmentation of power, energy or strength of action.

The supposed remedial effects of this class of medicines have been ascribed by some to the evacuation which they occasion; by others to the topical irritation of the mouth which they produce; and by others still to what has been called derivation and revulsion. Each of these views will be discussed in the sequel.

The remedial application of the Esstomatics is extremely limited, and as a class they are very unimportant medicines. They are however not absolutely useless. Upon the whole I consider them of more value than the Errhines. The diseases in which the Esstomatics have been ascertained to be capable of rendering more or less service are, 1. Odontalgia Rheumatalgica; 2. Acinesia Musculorum Deglutionis var. incompleta; 3. Acinesia Linguae var. incompleta; 4. Sialismus iners. In each and all of these cases, as appears to me, all the benefit which the Esstomatics produce, results from their topical irritation; but I shall say more upon this subject in connexion with the views and opinions of various authors.

There are some articles used as Masticatories, for purposes entirely different from those of the true and proper Esstomatics, as for example, *Nicotiana Tabacum*; but of this I shall have more to say in the sequel.

J. Moore Neligan says that "Sialagogues are substances which, by a local Stimulant action, augment the secretion of Saliva." (*J. M. Neligan Mat. Med. Dubl. Lond. 1847, Pg. 270.*) Neligan, like all writers on the materia medica, here confounds mere influence upon, and production of new condition and action in a part or organ, with increase of vital energy and strength of action, which is really what constitutes true Stimulation. Just so authors persist in employing the term Inflammatory in the sense of phlogistic, i. e. entonic, and in the sense of phlogotic, i. e. consisting in Phlogosis or topical Inflammation; but this last is not so much to be wondered-at, since very many members of the medical profession seem not yet to have discovered that Phlogosis or Inflammation is ever of the atonic diathesis. But if the term Stimulant, like the term Inflammatory, had only two senses, it would be well; but instead of this, its different significations seem to be legion, or at least its different applications, so that it is often difficult to conjecture what it does mean. Very often I am reduced to the necessity of considering this word as a mere

blank, and then of carefully inquiring what other term the general import of the sentence may happen to require. If we have any single word that will here express any thing like the correct idea, it is the word irritation; but this is not without objection. It does not certainly involve so great an error as the word Stimulation.

Neligan says "by this definition we exclude the so called remote or specific Sialagogues, as the preparations of Mercury, Gold, etc. which generally produce an increased flow of Saliva, when their internal use has been continued for some time; but as their remediate" (remedial—remediate means remedied, which is not the sense required) "powers do not depend merely" (really not at all) "on the increase of this secretion, it will, I think, be more practical to confine the term Sialagogue to those agents which are employed as direct Stimulants to the Salivary glands." (*Ibidem.*) Why the Mercurials and other Adenagics that are capable of being made to act disproportionately upon the Salivary glands, in comparison with the other subordinate parts of the secretant and absorbent or glandular system, of course through the medium of the constitution, should be called specific Sialagogues, any more than those which increase the Salivary secretion by Mastication and a topical irritation, without affecting any other part of the secretant and absorbent or glandular system, and of course without involving the constitution at large, I can not discover. For myself, I should think that the last group of agents might be called specific Sialagogues much more appropriately than any group of Adenagics, provided the term Sialagogue is not intirely rejected as the name of the class of which I am now treating. Neligan is the only author that I now have at hand who by his proper definition excludes the Mercurials from the class of Sialagogues, i. e. Esstomatics, as well as all the other Adenagics which are capable of being made to act upon the Salivary glands; and yet he continues to write, and I presume talk of these agents' producing Salivation and of their being Sialagogues, just as much as if he had not by his definition excluded them from the class of remedial agents which, with him as well as with others, bears this name. The real truth is that these agents alone, viz the Mercurials, etc. should retain this term Sialagogue and that exclusively; while a new and different term should be devised for

those articles which operate by mere topical application and irritation. This illustrates the utility and even importance of not being obliged to call totally different and distinct things by the same name; and of having as many different and distinct names as there are different and distinct powers, operations and effects, in the *materia medica*.

Neligan says "there are but few substances used at the present day in the practice of medicine for this purpose; and their application to the treatment of disease is very limited." (*Ibidem.*) In my whole professional life I never happened to know an Esstomatic prescribed only by way of placebo, except in imperfect and incomplete Acinesia of the muscles of deglutition. In such cases I have seen decided benefit derived from them provided they were used long enough. In such cases benefit can be expected only from Acrids. Neligan specifies but three comparatively intense vegetable Acrids, only one of which, as appears to me, patients could by any means be induced to masticate. Now no two Acrids ever have exactly the same peculiarities either as respects their acrimony, or the aggregate of their qualities, so that where one article would fail of producing the desired effect, another might succeed. Now there are more than three different sorts of Acrimony accompanied with more than three sorts of peculiarity in their general qualities. Beside this, there are more than three sorts of pathological conditions for which the Esstomatics may be indicated. Such facts contribute to prove that a much wider catalogue of articles should be found under this class. If three articles are enough, would not two be so; and if two are enough, why would not one be so? There is another consideration however, that looks to a much wider catalogue, viz. that the same Acrid is not found in all countries, or in every section of the same country, though equally good ones may be. Why should the physicians of the U. S. A. be obliged to send to Great Britain for one single Esstomatic, when we have full as good indigenous ones at our elbows; or why should our countrymen of the South be obliged to send to New England for a particular Esstomatic, when they have as good ones at their own doors? By all means let us have a liberal catalogue of articles well treated-of in our system of *materia medica*, with suitable directions for their preparation in our *pharmacopœiæ*, and let them all be found in our

shops, so that the medical practitioner everywhere may have opportunity to select the best article for his own cases ; or if there is no preference in a given number of articles, he may take that which is of the best quality on account of being collected at the right time, cleansed in the most appropriate manner, and preserved the best ; or if there is no other ground for selection, is the most abundant, and the cheapest for the patient ; for even the cost of the medicine is often an important consideration with many of the sick.

Cullen says that "Sialagoga are medicines suited to excite and increase the secretion of Saliva." (*Cull. Mat. Med. B. S. Bor. Edit. Philad. 1812, Vol. I. Pg. 123.*) This definition takes no cognizance of the increased secretion from the mucous follicles, which is doubtless produced by what I term Esstomatica, viz articles taken into, and kept in the mouth ; nor does it exclude those articles which increase the secretion of Saliva and mucus, as a part of an operation upon the whole secernents and absorbents or the glandular system, in consequence of being received into the stomach. J. Murray (essentially copying Cullen) says that "Sialagogues are those medicines which increase the Salivary discharge." (*J. Murr. Syst. Mat. Med. & Pharm. J. B. Beck. Edit. Fr. 4th, Edinb. Edit. N. Y. 1828, Part. I. Pg. 238.*) This definition is liable to the same objection as that of Cullen, since it comprehends articles that operate by an intirely different power and mode of employment. J. Murray adds that "this" (Salivation) "may be effected either by the mastication of substances which, by their Acrimony and pungency, excite the action of the vessels that secrete the Saliva, or by the internal exhibition of certain medicines." "Of the latter" (he says that) "Mercury is the only Sialagogue ; and such is the certainty of this operation of it, that all its preparations, when administered in certain quantities, produce Salivation to a greater or less extent." (*Ibidem, Pg. 238-9.*) It is not necessary that an article should be an Acid in order to produce an increased secretion of Saliva by mastication ; though Acrimony may perhaps be necessary to a medicinal grade or quality of this effect. This particular subject will however be reverted to hereafter, and therefore I need say nothing further of it in this place. It is not true that the Mercurials are the only agents that produce Sialism or Ptyalism by be-

ing taken into the stomach, operating upon the whole secernent and absorbent, or in other words, the glandular system, and affecting the Salivary glands, and apparently the mucous follicles of the mouth disproportionately. Elsewhere I mention a considerable number of articles that Salivate after the manner of the Mercurials. I have never seen any other articles but Adenagics do this. J. Murray says that "the Sialagogue operation of Mercury does not appear" (to be) "essential to its efficacy in any disease, but is regarded merely as a test of its acting on the system." (*Ibidem*, Pg. 239.) Salivation is indeed a test that the system is under the influence of the Adenagic which Salivates, and this even to a morbid degree, especially in the case of the Mercurials. But no such test is at all necessary, since there are abundant signs and symptoms without it. I would add expressly that Salivation is not only not necessary to the best medicinal effects of the Mercurials, but that it is a morbid and positively injurious operation. If there is any case in which positive Salivation is necessary to the most perfect remedial effects of the Mercurials, it is in Constitutional Lues Syphilis; and yet I have been in the habit of witnessing this disease radically cured without it. I need not even mention Local Lues Syphilis as requiring it, since I have long been convinced that this form of disease is best treated by topical remedies. Neither is it necessary as a test that the patient is under a proper medicinal grade of the operation of the Mercurials for this disease any more than for any other. There are tests enough without this.

In the section of country where I practised for the first dozen or fourteen years, the occurrence of Salivation among the patients of any physician would have seriously jeopardized his reputation and his business, and this, let it be remembered, was long before any organized sects (claiming and being popularly admitted to belong to the medical profession) had ever attempted to produce a prejudice against all use of the Mercurials, but more especially those which are more eminently Salivating, as the Disoxyd and the Dichlorid, in contradistinction from those which rarely Salivate, as the Protochlorid and the Protocyanid.

J. Murray says that "no satisfactory explanation has been given of the peculiarity which Mercury, under every form of preparation, has of exciting the secretion of Saliva. (*Ibidem*.)

From what seems to be meant by this statement I dissent wholly and intirely. I insist that we understand the *modus operandi* of Hydrargyrum as well as that of any other article. This may indeed be saying little for our knowledge of the operation of the Mercurials, but it is truly a well founded denial of any peculiar mystery in regard to them, in comparison with the rest of the *materia medica*, which is all that need be said. Murray's notion seems to be that there is a very peculiar mystery about the Salivating power of the Mercurials, to which I do not agree. Mercury is an Adenagic. Now Adenagics taken into the stomach, etc. operate directly and immediately, and in a peculiar manner already described, to increase secretory activity in the secernents and absorbents or the glandular system, etc. different articles belonging to this class of agents affecting certain parts of the glandular system more than any others. I consider it as quite certain that the whole class of Adenagics acts upon the secernents and absorbents or glandular system generally, ordinarily increasing secretory activity. Almost every individual Adenagic however acts more especially upon some subordinate part of the glandular system, as the kidneys, the skin, etc. Now the Mercurials, and a number of other articles, happen to act more especially upon the Salivary glands, but there is nothing more extraordinary in this, than if they had acted more especially upon the skin or kidneys. A given agent operates upon the whole alimentary canal; but it operates more especially upon the gastric and esophageal par vagum than upon the intestinal great sympathetic, and it is therefore more of an Emetic than Cathartic. Another article likewise operating upon the whole alimentary canal operates more upon the intestinal great sympathetic than upon the gastric and esophageal par vagum, and it is more of a Cathartic than an Emetic. Another article operates as a Narcotic upon the whole nervous system, but it affects the nerve of chymical action, nutrition, etc. more especially, so that, if pushed far enough, it would wholly suspend the function of this nerve, while the functions of several other parts of the nervous system still continue to be carried on. Another article acts as a Narcotic on the whole nervous system, but affects the nerves of expression more especially, so that if pushed far enough it would suspend their functions entirely, while the functions of several other parts of the nervous system still continue to

be carried on. Another article acts as an Erethistic upon the whole nervous system, and yet if pushed far enough it affects the nerves of voluntary motion disproportionately, fixing the muscles to which they are sent in repeated paroxysms of tonic Spasms. Now we know just as well why the Mercurials affect the Salivary glands more in proportion than any other part of the secernent and absorbent or glandular system, as we know why *Antiaris toxicaria* and more than a dozen other Narcotics affect the great sympathetic nerve disproportionately; or why *Strychnos toxifera* and more than a dozen other Narcotics affect the nerves of expression disproportionately; or why *Strychnos Nux-vomica*, *Coriaria Myrtifolia*, and more than a dozen other Erethistics affect the nerves of voluntary motion disproportionately. When it has been explained why every article of the materia medica operates more upon some particular part of the system, than upon every other, there will be justice in John Murray's seeming complaint that we have no explanation of the fact that the Mercurials act disproportionately upon the Salivary glands in comparison with the rest of the secernents and absorbents; or indeed why they act disproportionately upon the secernents and absorbents in comparison with the sanguiferous, or the nervous system. It is assuredly an equal mystery why every agent in the whole materia medica operates just as it does, as why the Mercurials Salivate. In short, I insist that there is no greater mystery about the operation of the Mercurials than about any thing else in the materia medica. I have insisted thus much upon this topic because it is constantly adduced as the great mystery of the materia medica—something intirely without a parallel—an anomaly as great as the supposed anomaly of the operation of *Digitalis purpurea*, when in reality there is no anomaly about the effects of either.

J. Murray says that "the Acrid Sialagogues, which are applied locally, by increasing the secretion of Saliva, and by their pungency, some times relieve the pain of Tooth ache." "They have been supposed useful by the derivation they occasion, in some kinds of Head-ache; and their pungency has been believed to operate with some advantage in Paralysis of the tongue, or of the muscles concerned in deglutition." (*Ibidem*, Pg. 239. I have repeatedly seen what I considered to be Rheumatalgic Tooth-ache relieved by the mastication of more or less active Acrids, or even

by holding them in the mouth for a sufficient length of time, either in powder or liquid, or where the Aching tooth happened to be carious, i. e. ulcerated, applying the Acrid to the Caries or Ulcer. The Acrid Essential Oils are often used as last specified with the most satisfactory success. Now in such cases the relief, as respects its speed and perfection, seems to be intirely unconnected with any preternatural secretion of Saliva. The relief is as rapid and as complete, and in fact I think more so, when the Acrid is so managed that there is no increase of the secretion of Saliva. I can not therefore fail of esteeming a Salivation as of no importance in such cases. As respects the irritation produced by the Acrimony of the article employed, I doubt not that this is of service, and upon the principle of counter-irritation.

I have likewise seen very decided benefit from the Acrid masticatories in imperfect or incomplete Acinesia or Paralysis (I do not know which it was) of the tongue and muscles of deglutition. Would any of the non-Acrid Masticatories render the same service? They certainly produce an increased secretion of Saliva, and some times a greatly increased one. I never knew a Head-ache, whether Rheumatalgic or any other form of Neuralgia, in any degree relieved by Masticatories of any sort. Symptomatic Head-aches I suppose no one would think of treating in this manner. From these facts I can not possibly persuade myself that what is called derivation and revulsion have any foundation in the operation and effects of any of the Masticatories.

J. Murray specifies only seven Sialagogues (comprising under this denomination all the articles that I call Esstomatics, together with one Adenagic, viz. Mercury and its preparations) five of which are Acrids, and sufficiently so to be useful as Oresthetics. One of the remaining articles, (viz. *Nicotiana Tabacum*) is not sufficiently Acrid to produce any medicinal or remedial effect by means of the very slight or trifling Acrimony which it possesses; nor is the mere Sialagogue effect which it produces of any medicinal or remedial value. When used as a Masticatory it exerts a Euphrenic and perhaps a Narcotic power; and it is for one or the other of these effects (for the former in a very great majority of cases) that Tobacco is so generally chewed. If all knowledge of Tobacco were to be wholly lost, the habitual, i. e. constant and protracted use of Masticatories, as well as Errhines, would soon

cease in our climate, whatever might be the fact in intertropical ones.

I know of no reason to conclude that either the nuts of *Areca Catechu*, and according to Lindley, *Areca oleracea*, or the leaves of *Chavica Betle* and *Chavica Siriboa*, which constitutes Betel, are either Euphrenic or Narcotic, notwithstanding they are commonly said in books to be intoxicating, a term almost as vague and as loose as the term Stimulant. Both nuts and leaves are declared on good authority to be Styptic and pungent. What effects Betel is taken-for I know not. If facts were only sufficiently known, *Erythroxyton Coca*, and possibly *Paullinia sorbilis* and *Catha edulis* and *Catha spinosa* might prove substitutes for Tobacco, the first being indeed much preferable.

Murray's remaining Sialagogue is *Hydrargyrum*, which operates by virtue of an intirely different power, and by a different mode of employment. He says that "as a class of remedies, Sialagogues are of little importance." (*Ibidem. Pg. 239.*) This is true, but still they are of some value; I may safely say of considerably more than the Errhines.

Richard Pearson says that "Sialagogues are medicines which excite a flow of Saliva" (*R. Pears. Pract. Synops. Mat. Al. & Mat. Med. Lond. 1808, Pg. 123.*) He says that Sialagogues are of two kinds, viz. 1. Those which act topically; and 2. Those which affect the system at large. (*Ibidem.*) Pearson says "of the first kind are Masticatories or certain resinous, aromatic and bitter substances, which Stimulate the Salivary glands and increase their secretory activity without being received into the circulation. (*Ibidem.*) He says of the first kind that "they are useful in Tooth-ache and Paralytic affections of the tongue." (*Ibidem.*) My views in regard to all this will be sufficiently obvious, from what I have already said. These quotations serve to show which way the wind blows with Dr. Pearson, a writer, be it remembered, of just about the time of John Murray, but differing from him in being an actual practitioner of medicine, which is said never to have been the fact with Murray. Ordinarily we suppose that a man who, after a good medical education, has spent the rest of his life in the practice of his profession, must be capable of writing a more useful and practical work, than one who has never had any opportunities of clinical obser-

vation and experience. I think however, that it might be somewhat difficult to settle the precedence between Pearson and Murray. If either deserves it, for myself, I should rather be inclined to assign it to Murray. In this place however I should not omit to state one fact, viz. that a great majority of all the practitioners of medicine, with whose professional views I have happened to become acquainted, have coincided with Pearson and his contemporaries, rather than with any later writer. With the exception of a few men, who I have considered as meriting the highest pre-eminence, but who did not seem to be very well understood by their professional brethren, most of the new and peculiar views and opinions that have been advanced since the time of Pearson and Murray, have received very decided disapprobation from the great body of the actual practitioners, in whose neighborhood I have happened to reside. It has been very often said to me as an instructor in the materia medica "ah! none of your teachings at the present time are as truthful and as practical, and none of you understand the subject any where near as well as Pearson and Murray." When I was an instructor in the materia medica, there was an incessant complaint of the great body of the students of medicine, and even of their private instructors, that I deviated so much from such standard authorities as John Murray, etc. Now I do not suppose that the opinions upon this class, of Pearson and his contemporaries, can be deemed of any very great importance: yet soundness of judgement is often as manifest in small things as in great; and as seems to me Pearson is more absurd upon the so-called Sialagogues than any other author.

Pearson specifies only five Sialagogues of vegetable organic-origin. Two of these are Acrid roots; one is an Acrid bark; one is merely a dry resin, as near as I now recollect destitute of any true and proper Acrimony. The other Sialagogue is Tobacco, whose operation, as I have already said, is utterly unlike any of the rest of the articles mentioned by Pearson as belonging to this class. Tobacco is an Adenagic capable of acting upon the whole secretory and absorbent or glandular system, and by appropriate regimen it may be made to act much more in proportion upon some excretories than upon others, as the renes for example. Now if Nicotiana is a true and proper Adenagic, it may possibly, but not probably, operate as such, even by such a limited application

as the inside of the mouth. This however, only assimilates this agent to Hydrargyrum and other Adenagics, and removes it farther from the Esstomatics. Though I never happened to know it act disproportionately upon the Salivary glands when taken internally, yet I should think it as likely to do so, as Conium maculatum, which is well known to do this frequently. But Tobacco is Euphrenic and Narcotic, Cathartic and Emetic, as well as Adenagic, and when it is taken as a Masticatory it always produces one or more of those effects. It is never however, its Adenagic operation for which Tobacco is employed as a Masticatory, or is drawn into the mouth in the form of Smoke impregnated with some active principle which is either an educt from it, or a product of its imperfect combustion. In its crude state, i. e. merely as dried leaves, I am not aware that any active principle is known to be contained in Tobacco, unless the compound radical of the Alcaloid Nicotina, viz. H. C. N. is active, which is contrary to analogy and is not probable. After the dry leaves have been sprinkled with water, and left in a heap for some time, the Alcaloid Nicotina becomes fully formed by the oxydation of its compound radical, and is then active. This Alcaloid is very well known to be an efficient Narcotic of that sort which destroys life by suspending the functions of the nerve of chymical action, nutrition, etc. How many or whether any of the other powers of Tobacco depend upon this Alcaloid, has never to my knowledge been ascertained. From the manner in which Tobacco is smoked (as the common language is) we should suppose that it would be intirely decomposed by this process, as the Alcaloids generally are decomposable by a temperature of 212° Fahrenheit. When used as a Masticatory, we should not suppose that this Alcaloid could possibly be decomposed. But I am not apprised that there is any material difference between the effects of Tobacco used as a Masticatory and smoked.

Tobacco is considered as containing an Oxyd of a compound radical of H. C. (without N.) which has been erroneously named Nicotianina, as if it were an Alcaloid, which it certainly is not. It is not even known to be basic with any Acid. Whether this exists in the crude plant, or is formed afterwards; or whether it possesses any medicinal activity or not, does not appear from books. During an imperfect and half smothered combustion of

Tobacco, which seems to take place when it is smoked, an Empyreumatic Essential Oil is formed, which seems to be a highly active Narcotic, of that sort which destroys life by suspending the functions of the nerves of expression. In fact all that we know of the medicinal powers of the Alcaloid Nicotina and of the Empyreumatic Essential Oil is simply that they are active Narcotics, the one operating more especially upon the nerve of chemical action, nutrition, etc. the other acting more especially upon the nerves of expression. Upon what proximate principles the Adenagic, the Euphrenic, the Cathartic and the Emetic powers of Tobacco depend, I must confess myself most profoundly ignorant; and I have never been able to obtain any light upon the subject, either from books, or private sources. Now I believe that Tobacco (as I have said elsewhere) is never taken as a Masticatory for the purpose of producing Adenagic effects, but always for the production of Euphrenic ones, and some times possibly for a slight degree of Narcotic ones, though I do not suppose that this is understood by those who habitually masticate it. It is sufficient for them that it allays certain uneasy and irksome sensations which they feel without it, and produces certain highly agreeable effects. No other articles within my knowledge, except Erythroxylon Coca and Catha edulis, are used as Masticatories, for the sake of their Euphrenic effects. The only case in which I have ever known Tobacco employed as a Masticatory for its Narcotic operation has been for Tooth-ache; and I believe that it is effectual in this way only in those who do not use it habitually. But though Tobacco is habitually used as a Masticatory only for its Euphrenic effects, yet almost always it contributes to keep the alimentary canal more lax than it would otherwise be; and where there is a predisposition to Diarrhœa chronica, it frequently proves a procataretic cause of this malady, kindling it into action, or augmenting it and rendering it more obstinate and unmanageable when it already exists. It often operates in the same manner in regard to Limosis Emesis as in regard to Diarrhœa chronica; but the former is much more common than the latter.

I have said that Nicotiana is chewed only for its Euphrenic, and perhaps occasionally for a certain degree of its Narcotic effect, and not for the ordinary effects of a Masticatory, i. e. the direct increase of the secretions from the mouth, viz. that from



the Salivary glands, and that from the mucous follicles, and thus by topical application producing (as is supposed) a peculiar irritation. All these circumstances assimilate Tobacco to Mercury, so far as relates to operation upon the system at large.

Under his second kind of Sialagogues, Pearson specifies more than twenty Mercurial preparations. He says expressly "of the second kind is Quicksilver, which being introduced into the stomach, or rubbed on the skin, is taken-up by the absorbents, and through the medium of that set of vessels, is brought to act upon the Salivary glands." "From the course which it takes, it acts upon the system at large, as well as upon these glands; and hence its efficacy in curing many diseases, which resist the operation of other remedies." (*R. Pears. Pract. Synops. Mat. Al. & Mat. Med. Lond.* 1808, *Pg.* 123.) According to Pearson, all the Mercurials are ranked in the class Sialagogues (as I suppose) merely because they Salivate. Whether he supposes that all their remedial effects result from Salivation I know not; but if such is not his view, such should not have been his classification. Classification in the materia medica should never be founded upon a power, operation or effect, which is not medicinal; and assuredly Mercurial Salivation is not such, but on the contrary, it is an ultimate Adenagic effect, one which transcends its medicinal grades of operation, and is really and truly a morbid effect. I know of no reason to conclude that the process of Salivation by any Mercurial preparation is ever of the least service for the relief or cure of any disease. Beside the vegetable Adenagics already mentioned, there is still a considerable number, which, when used freely and protractedly, not infrequently affect the Salivary glands disproportionately and produce a Salivation in a manner perfectly analogous to that of the Mercurials; and I have often been surprised that the fact is not much more generally known. *Polygala Senega*, *Polygala grandiflorum*, *Eryngium Yuccifolium*, *Urginea Squilla*, and various other vegetable articles operate in this manner.

F. W. Headland says of Sialagogues, "this name is applied to medicines which in various ways increase the quantity or promote the excretion of the Saliva." (*F. W. Headl. Ess. on Act. Med. in Syst. Lond.* 1855, *2d Edit. Pg.* 303.) What Mr. Headland here says is indeed true, as appears to me greatly to

dwelt-upon any farther than barely to say that what Dyspepsia we have had could not by any means be traced to much spitting. It occurred much oftener in women who do not use Tobacco as a masticatory, among us; and more frequently in men who did not use this article, than in those who did. It would have been a matter of interest if Mr. Headland had explained how it happens that the Germans remain so free from the morbid peculiarities which he seems to think are produced by much spitting in the inhabitants of the U. S. A. though to all appearance they use Tobacco much the most freely.

"Sialagogues" (says F. W. Headland) "are seldom employed as remedial agents, for the excretion of Saliva is constant and very rarely suppressed, and it is so small in quantity, and so great a source of inconvenience when increased to any amount, that Sialagogues can never be employed as general evacuants" (*Ibidem*, Pg. 303-4.) Heretofore I have expressed my opinion that Sialagogues, as I distinguish them from Esstomatics, are not only of no use or benefit as Sialagogues, but when pushed to the extent of producing a considerable preternatural secretion of the Saliva, are always more or less injurious, and often highly so. The Esstomatics as I am in the habit of distinguishing them from the Sialagogues, are unquestionably of limited use (as I have heretofore said) in Rheumatalgic Tooth-ache, and in Imperfect or incomplete Acinesia, or (possibly but not probably) Paralysis of the tongue and muscles of deglutition, and it is not unlikely in some other analogous diseases.

J. Forbes Royle says that "Sialagogues are medicines which increase the secretion of Saliva." (*J. F. Royle Man. Mat. Med. and Therap.* 2d Edit. Lond. 1853, Pg. 759.) Some thing more discriminating and just should have been given by such a man as Dr. Forbes; but I have already commented sufficiently upon such vague and in fact incompatible views. Royle says that an increase of the secretion of Saliva "may frequently be effected by chewing a nearly inert substance, such as Mastic, or an Astringent, such as Catechu, or a Stimulant" (rather irritant) "as Chavica Betle, or by the secondary effects of Nauseants, or produced by the action of Mercurials, when not only is the secretion increased, but the medicine itself is excreted." (*Ibidem*, Pg. 759-60.) Though the mastication of inert substances will often

Here seems to be an express recognition that this class prove medicinal by means of the counter-irritation which it produces, instead of the Salivation. I have no belief that either Head-ache or Ear-ache, or Neuralgic or Chronic-Rheumatalgic affections of the face, are ever capable of relief by the Acrid Esstomatics or Masticatories. They have been long recommended in such cases, but I have never been able to find the physician who had ever witnessed any benefit from them. On the other hand I have witnessed benefit from them in Rheumatalgic Tooth ache, and in imperfect or incomplete Acinesia or perhaps Paralysis of the tongue and muscles of deglutition ; and I have received so much testimony corroborating my own experience, that no ground for doubt remains in my own mind.

Headland says that " the chewing of Betel, Tobacco and other substances is frequently found useful by sailors on long voyages, and is adopted as a preservative against Diarrhœa and Dysenteria, with which they are so often affected." " The advantage is to be attributed to the increase of the Salivary secretion." (*Ibidem.*) So far as I have been able to obtain evidence, the nuts of Areca Catehu or Areca oleracea, commonly called Betel Nuts, are merely and purely Styptic ; while the leaves of Chavica Betel and Chavica Siriboa are merely and purely pungents or Acrids of a certain peculiar character. Protoxyd of Calcium commonly called Quick Lime is primarily Oresthetic, but if its use is continued long enough, it finally proves neuragic and exhausting. The Betel then which is so much used in the intertropical East-Indies, is mainly Styptic and Oresthetic, since it is composed of these three articles. I am aware that it is often said to be Intoxicating but what this may be I do not exactly know, since this term is used almost as loosely and vaguely as the term Stimulant. At all events, I know of no evidence that Betel possesses any other powers than I have ascribed to it above. It is barely possible therefore that the mastication of Betel may be prophylactic of intertropical Diarrhœa and Dysenteria, though I should not be inclined to repose any great confidence in it. The Chavica is undoubtedly the most important ingredient in it for the purpose in question.

As respects the exertion of a prophylactic power against Diarrhœa and Dysenteria by Tobacco when masticated, I am incredulous. I have certainly known its use by mastication and smok-

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pure Astringents or Styptics, and the pure Stimulants, meaning thereby what I call Antisbestics, are in no sense Sialagogue otherwise than food, or any inert Masticatory. The Styptics may indeed benefit a Sore mouth by virtue of their Styptic power; but this is a power which is already the foundation of a class, and can not be the foundation of an other, or a part of the foundation of an other. In the third place, the Spices are not medicinal Esstomatics unless they are Acrid; and if they are Acrid, they ought to be merged in the Acrids; so that we thus reduce Dr. Royle's really medicinal Esstomatics to Acrids merely.

The synonyma of this class is not considerable. It is most commonly called *Sialagoga*, and it might as well have been called *Ptyalagoga*, an equally classical term. The first part of each of these names are ancient Greek words denoting *Saliva*, and the last part is a Greek verbal attribute having the import of *educing*; *eliminating*; etc. But this part of these terms has already been explained in different words of the same meaning, in connexion with *Uragoga*, *Hydrotagoga*, *Emmenagoga* and *Blennagoga*. The latter part of the terms *Neuragica* and *Adenagica* is derived from the same original source, but with a different sense. *Sialismus* is as legitimate Greek as *Ptyalismus* and has exactly the same meaning. The latter has been commonly used as the name of the most prominent effect of the *Sialagoga*. It is not a little singular that for general use among physicians as the name of the class, *Sialagoga* should have been preferred to *Ptyalagoga*, while as the name of the effect, *Ptyalismus* has been preferred to *Sialismus*. It would seem to have been much more obvious and natural to employ *Sialismus* with *Sialagoga* and *Ptyalismus* with *Ptyalagoga*. But it is impossible to account for many of the strange anomalies that we find in the use of language. For aught that I can discover, the terms *Sialitica* and *Ptyalitica* might have been as appropriate names for a class in the *materia medica* as *Sialagoga* and *Ptyalagoga*; though they do not appear to deserve any preference. But all these terms are grossly incorrect, and therefore improper and inadmissible in application to the group of agents to which I apply the term *Esstomatica*, since their medicinal effects do not in the least depend upon the preternatural increase of the secretion of *Saliva* which they occasion. Now it is contrary to all sound

from not having studied and investigated them thoroughly. I never knew Cyanid of Hydrogen, or (if it is an Acid) Cyanohydric Acid, used as a Masticatory, or indeed any compound of Cyanogen, and therefore I can say nothing of its operation, when employed in this manner, from my own observation and experience. I am however well acquainted with its use and effects, as they result from its being taken into the stomach. Thus administered it appears to me to be a much less effectual Sedative than Papaver and several other Narcotics which I might mention. I never witnessed the least tendency in this article to produce any thing like Paralysis of any part or organ. Even where it is pushed to such an extent as to destroy life, it accomplishes this by suspending the functions of the nerves of expression, leaving the functions of the nerve of chymical action, nutrition, etc. (upon which the secernent and absorbent or glandular system depends) in a state of apparent integrity. Even the suspension of the function of the nerves of expression, which fatal doses produce, seems to be altogether unlike Paralysis. There is a considerable number of articles operating exactly like Cyanid of Hydrogen, which should have been mentioned here, if this article deserves such mention, as for example the Emphyreumatic Essential Oil of Tobacco, the substance called Curarina or Curarine probably the Benzhylid of Hydrogen, and many others. All these several articles are simple, pure and intense Narcotics, without any other powers in addition. As Narcotics doubtless every grade of their power and operation has certain peculiarities in quality, which can not be described diagnostically in words. The difference between these and the Narcotics in more common use does not consist in their being more eminently and peculiarly Sedatives, but in their having no other powers conjoined. For illustration, Papaver is more highly Sedative than the Cyanid of Hydrogen, but Papaver is Euphrenic, Antisbestic, perhaps Erethistic and Diaphoretic in addition. Now neither of these different and distinct powers are at all opposite to, or incompatible with its Sedative power, which is only a part of its Narcotic power, just as the Sedative power of Cyanid of Hydrogen is only a part of its Narcotic power. But I do not think that any of these articles should be mentioned in this class, since none of these are appropriate for Mastication; none of these are true and proper irritants of

ing, produce Chronic Diarrhœa, which was suspended spontaneously on discontinuing the use of Tobacco. The reason assigned by many persons for the use of this article is habitual Coprostasis, which it is commonly believed to have the power of relieving. If all this is true, and I have such testimony of it that I am unable to doubt it, I can not well suppose that it is likely to answer the purpose for which Mr. Headland deems it useful. But how a prophylactic power against Diarrhœa and Dysentery in masticated Betel and Tobacco can possibly be shown to depend upon the increase of the secretion of Saliva, which they occasion, as Mr. Headland supposes, I am unable by any means to conjecture. Perhaps others may be more fortunate in this respect than I am. If so I must leave it to them to elucidate the subject.

Headland mentions an other group of articles which used as Masticatories prove Sialogogue in quite a different manner. He calls these Sedatives, and he specifies "Cyanohydric Acid" (which is neither sour, nor does it seem to perform the functions of an Acid) "Digitalis." Along with these he associates "Nauseants." He seems to suppose that these "paralyze the muscular fibers" (of what?) "by which the constriction of the Salivary ducts is maintained" (!!) "and thus allow the secretion to pour out uncontrolled into the cavity of the mouth." (*Ibidem*, Pg. 304-5.) A little explanation in regard to a matter of classification in the materia medica seems to be here necessary for the ready understanding of Headland in these statements. At the present period, Cyanid of Hydrogen and Digitalis purpurea are considered by some as not possessing true Narcotic powers, but the power or powers that actually belong to them is denominated Sedative. With those who entertain this view, an agent to be entitled to the appellation of Narcotic must have all the several different and distinct powers (as I view them) that belong to Camphor, Papaver, Wine, Alcohol, Nutmeg, Tansy, etc. In short, one simple and pure Narcotic, and another also, which in fact possesses an additional power that is intirely overlooked, are constituted a class in the materia medica under the name of Sedatives; while the class Narcotics is made to comprise those articles which have several other powers in addition. It is the fact however, that those who adopt this classification have several simple and pure Narcotics among what they call such, apparently

from not having studied and investigated them thoroughly. I never knew Cyanid of Hydrogen, or (if it is an Acid) Cyanohydric Acid, used as a Masticatory, or indeed any compound of Cyanogen, and therefore I can say nothing of its operation, when employed in this manner, from my own observation and experience. I am however well acquainted with its use and effects, as they result from its being taken into the stomach. Thus administered it appears to me to be a much less effectual Sedative than Papaver and several other Narcotics which I might mention. I never witnessed the least tendency in this article to produce any thing like Paralysis of any part or organ. Even where it is pushed to such an extent as to destroy life, it accomplishes this by suspending the functions of the nerves of expression, leaving the functions of the nerve of chymical action, nutrition, etc. (upon which the secernent and absorbent or glandular system depends) in a state of apparent integrity. Even the suspension of the function of the nerves of expression, which fatal doses produce, seems to be altogether unlike Paralysis. There is a considerable number of articles operating exactly like Cyanid of Hydrogen, which should have been mentioned here, if this article deserves such mention, as for example the Empyreumatic Essential Oil of Tobacco, the substance called Curarina or Curarine probably the Benzhylid of Hydrogen, and many others. All these several articles are simple, pure and intense Narcotics, without any other powers in addition. As Narcotics doubtless every grade of their power and operation has certain peculiarities in quality, which can not be described diagnostically in words. The difference between these and the Narcotics in more common use does not consist in their being more eminently and peculiarly Sedatives, but in their having no other powers conjoined. For illustration, Papaver is more highly Sedative than the Cyanid of Hydrogen, but Papaver is Euphrenic, Antisbestic, perhaps Erethistic and Diaphoretic in addition. Now neither of these different and distinct powers are at all opposite to, or incompatible with its Sedative power, which is only a part of its Narcotic power, just as the Sedative power of Cyanid of Hydrogen is only a part of its Narcotic power. But I do not think that any of these articles should be mentioned in this class, since none of these are appropriate for Mastication; none of these are true and proper irritants of

ing, produce Chronic Diarrhoea, which was suspended spontaneously on discontinuing the use of Tobacco. The reason assigned by many persons for the use of this article is habitual Coprostasis which it is commonly believed to have the power of relieving. If all this is true, and I have such testimony of it that I am unable to doubt it, I can not well suppose that it is likely to answer the purpose for which Mr. Headland deems it useful. But how a prophylactic power against Diarrhoea and Dysentery in masticated Betel and Tobacco can possibly be shown to depend upon the increase of the secretion of Saliva, which they occasion, as Mr. Headland supposes, I am unable by any means to conjecture. Perhaps others may be more fortunate in this respect than I am. If so I must leave it to them to elucidate the subject.

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from not having studied and investigated them thoroughly. I never knew Cyanid of Hydrogen, or (if it is an Acid) Cyanohydric Acid, used as a Masticatory, or indeed any compound of Cyanogen, and therefore I can say nothing of its operation, when employed in this manner, from my own observation and experience. I am however well acquainted with its use and effects, as they result from its being taken into the stomach. Thus administered it appears to me to be a much less effectual Sedative than Papaver and several other Narcotics which I might mention. I never witnessed the least tendency in this article to produce any thing like Paralysis of any part or organ. Even where it is pushed to such an extent as to destroy life, it accomplishes this by suspending the functions of the nerves of expression, leaving the functions of the nerve of chymical action, nutrition, etc. (upon which the secernent and absorbent or glandular system depends) in a state of apparent integrity. Even the suspension of the function of the nerves of expression, which fatal doses produce, seems to be altogether unlike Paralysis. There is a considerable number of articles operating exactly like Cyanid of Hydrogen, which should have been mentioned here, if this article deserves such mention, as for example the Emphyreumatic Essential Oil of Tobacco, the substance called Curarina or Curarine probably the Benzhylid of Hydrogen, and many others. All these several articles are simple, pure and intense Narcotics, without any other powers in addition. As Narcotics doubtless every grade of their power and operation has certain peculiarities in quality, which can not be described diagnostically in words. The difference between these and the Narcotics in more common use does not consist in their being more eminently and peculiarly Sedatives, but in their having no other powers conjoined. For illustration, Papaver is more highly Sedative than the Cyanid of Hydrogen, but Papaver is Euphrenic, Antisbestic, perhaps Erethistic and Diaphoretic in addition. Now neither of these different and distinct powers are at all opposite to, or incompatible with its Sedative power, which is only a part of its Narcotic power, just as the Sedative power of Cyanid of Hydrogen is only a part of its Narcotic power. But I do not think that any of these articles should be mentioned in this class, since none of these are appropriate for Mastication; none of these are true and proper irritants of

the mouth ; none of them are well adapted to increase the secretion of Saliva by topical application to the cavity into which this secretion is poured ; nor do I think that any of them can by any possibility operate in the manner in which Headland supposes them to operate. *Digitalis purpurea* is very nearly a simple and pure Narcotic, but yet is not absolutely such, since it is certainly Adenagic in addition. But this Adenagic power has been generally overlooked as a different and distinct power, though its influence upon the secernent and absorbent or glandular system has been too prominent to escape all notice. All physicians recognize its Diuretic operation ; and it has proved Sialagogue exactly after the manner of Mercury often enough to have this operation recognized also. How those who rank *Digitalis* as a mere and pure Sedative account for its Diuretic operation I know not, but Mr. Headland has given his own explanation of its Sialagogue effects. Perhaps he would account for its Diuretic effects in the same manner. As would seem, he supposes that by its great Sedative power it is enabled "to paralyze the muscular fibres by which the constriction of the Salivary ducts is maintained, and thus" (to) "allow the secretion to pour-out uncontrolled into the mouth." I suppose that, of course, he would explain its Diuretic operation in the same manner, though he does not say so *totidem verbis*. This implies some thing new in the mechanism of the secretory apparatus of the Saliva, and I suppose also of the urine, which the anatomists and the physiologists have not yet given us. Unfortunately however, this explanation is unsatisfactory on several grounds. In the first place, neither Cyanid of Hydrogen nor *Digitalis purpurea* appear to possess any degree of real paralyzing power, or even an Acinetie one—at least I know of no evidence that they possess either—nor are they by any means as highly Sedative as various other Narcotics and *Papaver* especially ; and Headland's view does not at all account for the operation of *Digitalis* upon some other parts of the secernent and absorbent or glandular system ; as for example, its resolvent power, i. e. its power of producing a resolution of certain topical Phlogoses by being taken into the stomach and operating upon the system generally or universally.

Headland says that "these topical irritants" when used as "Masticatories are not true eliminatives." (*Ibidem*, Pg. 304.)

He says that "true or eliminative Sialagogues are medicines which are actually excreted from the blood by the Salivary glands, and which increase their natural secretion while passing through them. (*Ibidem*, Pg. 305.) If I understand him aright, it is only those articles that increase the secretion of Saliva by being taken into the stomach, by being specially determined and carried to the Salivary glands, or as some would say, by producing their effects through the medium of the constitution, that are "true eliminations;" and these I suppose, derive their name from the belief of many that the medicine is eliminated from the system in the excretion which is preternaturally and disproportionately increased. But why should not everything that produces a disproportionate effect upon any particular part, through the medium of the constitution, and by means of being taken into the stomach, be equally required to be brought by the blood to such part, collected and concentrated upon it, and finally eliminated by it, as much as those articles that prove Sialagogue in the same way?

I have elsewhere bestowed some consideration upon the question whether actual contact of a medicine with a particular part or organ, by means of its entering into the mass of the circulating fluid and a special determination of it to that part or organ, is necessary to its more particular operation upon such part; and I need not repeat what has been already said. At all events, the excretion of a medicine in its intire state from the part on which it more especially acts, can not be necessary in all cases, since the parts so acted-upon are not always excretory organs, and therefore can not by any possibility so eliminate a medicine. In fact, most of the articles that act more especially upon particular excretories, act in a less, but still prominent degree upon the whole secernent or glandular system. This is notorious of the Mercurials. Are they eliminated at every excretory? But there are numerous parts that are more especially acted upon, and that even very prominently, by particular medicines, which are incapable of eliminating any thing. *Claviceps purpurea* acts upon the nervous system generally, but much more especially upon that branch of the nerve of chiminal action, nutrition and reproduction, upon which the parturient action of the uterus depends. But does the nervous system eliminate any thing?

Headland says that no true eliminant Sialagogue is "given for the purpose of producing Salivation, but in cases where the full action of the medicine is desired, this symptom is made use of as a sign that it has taken full effect upon the system." (*Ibidem*, Pg. 305.) I have already commented upon a statement similar to this, so that nothing need be said further in this place upon either of the two points involved.

Headland says that "when the quantity of the Saliva is thus increased, it should not be rejected, but always swallowed when possible; for this secretion is apparently useful in the stomach, and in some way essential to the proper carrying-on of the digestive process." He says "on the other hand, we find that the practice of constant spitting is productive of very injurious effects; and it is more than probable that the pale faces, lank figures and Dyspeptic maladies, which are so common among the American people" (I suppose meaning the inhabitants of the U. S. A.) "may be due in part to the prevalence of this habit among them." (*Ibidem*. Pg. 304.) He is undoubtedly correct when he gives us to understand that the Sialagogues do not prove medicinal by virtue of Ptyalism as an evacuation; and he might have added by virtue of Ptyalism at all. It might have been well if he had added, that they are some times productive of much evil by the evacuation which they occasion. Probably however he did not know that there is at least one case on record, stated by the physicians in attendance, where the patient was Salivated more than a barrel. This was not stated or spoken of as any thing extraordinary in the practice of the time and place, and apparently attracted no particular attention, so that probably it was not a solitary case.

Now suppose that Headland's view is true that in Mercurial Ptyalism, the Mercurial which produces it is always eliminated in the Saliva of which there is such a greatly increased secretion; and suppose that this Saliva is constantly swallowed, when may we expect such Ptyalism to cease? The same question may be asked in regard to every other case in which Ptyalism is produced in the same manner as by Mercury. I wish that he had given us his views much more in detail, and more particularly his evidences in their favor, in regard to the use of the Saliva in the stomach and for the digestive process, and had furnished us

with some explanation or some rationale of its deficiency's producing "the pale faces, the lank figures, and the Dyspeptic maladies, which" (he says) "are so common among the American" (i. e. the United States) "people." Perhaps it might be satisfactory to some, if he had showed that the people of the United States are more in "the practice of constant spitting," than the people of England and other countries. So far as my observations justify an opinion, foreigners (as well Englishmen as others) intirely outdo us in this respect. However, I do not suppose that the Englishmen and other foreigners that I have happened to meet-with in our-country always belong to the most refined classes at home, any more than the persons with whom a foreign traveler is brought into contact upon our public roads and in our taverns. But I do not care to "settle the precedence between a Louse and a Flea." This matter I am perfectly willing to waive, since the practice of incessant spitting is wholly factitious, and at the same time so offensive and ungentlemanly as to deserve the ban of all society in any degree polished and refined and not to merit one word in its defence. At all events, it seems to me that we are very far surpassed, in the matter in question, by such Germans as I have met-with among us; and if we may confide in testimony, by the Germans at home. As to Mr. Headland's opinion that the inhabitants of the U. S. A. are as a people more pale and lank than the inhabitants of Britain, I think that he is probably right; and yet I should not be surprised if on more thorough investigation it should finally appear that he is wrong. But whichever way the question shall ultimately be decided, I think I have good reason for disbelieving that it has any connexion with habitual spitting, since, as a general rule, these characteristics are not found among the masticators of Tobacco, and consequently not among the greatest spitters, nothing else being used among us, in the same way as Tobacco.

As to our greater liability to Dyspepsia than the inhabitants of Britain, I utterly deny it. A number of years ago I had occasion to make some inquiries in regard to this matter, and to search the periodicals in relation to it; and though my investigations were necessarily far less thorough and complete than I could have wished, yet they were sufficient to lead me to a different conclusion from Mr. Headland's. My result need not be

dwelt-upon any farther than barely to say that what Dyspepsia we have had could not by any means be traced to much spitting. It occurred much oftener in women who do not use Tobacco as a masticatory, among us; and more frequently in men who did not use this article, than in those who did. It would have been a matter of interest if Mr. Headland had explained how it happens that the Germans remain so free from the morbid peculiarities which he seems to think are produced by much spitting in the inhabitants of the U. S. A. though to all appearance they use Tobacco much the most freely.

"Sialagogues" (says F. W. Headland) "are seldom employed as remedial agents, for the excretion of Saliva is constant and very rarely suppressed, and it is so small in quantity, and so great a source of inconvenience when increased to any amount, that Sialagogues can never be employed as general evacuants" (*Ibidem*, Pg. 303-4.) Heretofore I have expressed my opinion that Sialagogues, as I distinguish them from Esstomatics, are not only of no use or benefit as Sialagogues, but when pushed to the extent of producing a considerable preternatural secretion of the Saliva, are always more or less injurious, and often highly so. The Esstomatics as I am in the habit of distinguishing them from the Sialagogues, are unquestionably of limited use (as I have heretofore said) in Rheumatalgic Tooth-ache, and in imperfect or incomplete Acinesia, or (possibly but not probably) Paralysis of the tongue and muscles of deglutition, and it is not unlikely in some other analogous diseases.

J. Forbes Royle says that "Sialagogues are medicines which increase the secretion of Saliva." (*J. F. Royle Man. Mat. Med. and Therap. 2d Edit. Lond. 1853, Pg. 759.*) Some thing more discriminating and just should have been given by such a man as Dr. Forbes; but I have already commented sufficiently upon such vague and in fact incompatible views. Royle says that an increase of the secretion of Saliva "may frequently be effected by chewing a nearly inert substance, such as Mastic, or an Astringent, such as Catechu, or a Stimulant" (rather irritant) "as Chavica Betle, or by the secondary effects of Nauseants, or produced by the action of Mercurials, when not only is the secretion increased, but the medicine itself is excreted." (*Ibidem*, Pg. 759-60.) Though the mastication of inert substances will often

produce a great increase of the secretion of Saliva, will it produce any of the remedial effects of the Esstomatics? I answer confidently in the negative. Now this fact sufficiently evinces that the medicinal effects of the Esstomatics or Masticatories can not be at all due to the increase of the secretion of Saliva—a fact the knowledge of which is of considerable importance; so that we are here indebted to Dr. Forbes for mentioning some thing valuable, which has been omitted by most other writers upon this subject. The increase of the secretion of Saliva that is produced by the Nausiatica is as different, both in its antecedents and in its effects, from that produced by the mastication of Acrids, as that produced by the Mercurials. I have already pointed-out the total difference and distinctness of the Salivation produced by the Mercurials, and other Adenagics occasioned by taking them into the stomach, from the Salivation produced by the Acrid Esstomatics; difference and distinctness not only as respects its antecedents, but as respects its effects and consequences.

Royle says that Sialagogues “may be useful from their local, or from their derivative effects, in affections of the head and face.” (*Ibidem*, Pg. 760.) I have no more belief in the doctrine of derivation and revulsion as produced by the Esstomatics, or even the Sialagogues in contradistinction from the Esstomatics, than I have as produced by the Errhines. The remarks that I made under the Errhines in relation to the subject, are equally applicable here, and need not be repeated. I doubt not that all the remedial effects which the Esstomatics ever produce always result from their topical irritation, or in another word, their counter-irritant operation.

Royle's Sialagogues are 1. Acrids, 2. Spices, 3. Astringents, 4. Stimulants, 5. Mercurials. None of these groups require explanation except the Stimulants; and these are Oil of Cloves along with his Spices, of which Ginger and several species of Capsicum and Pepper may be taken as a specimen, and Creasote perhaps with his Acrids, of which Mustard, Horse-Radish, Mezerum, etc. may be named as specimens.

A very few words upon Dr. Royle's classification of his Sialagogues will be sufficient. In the first place, the Mercurials should never have been associated with the other groups, since their operation is totally different and distinct. In the second place, the

the par vagum, one of the involuntary motor nerves of expression received by the pharynx, œsophagus and stomach. Some have maintained that this nerve is also received by a small portion of the upper and smaller intestines; but this opinion seems to be founded not upon anatomical demonstration, but upon the supposed necessity for it, on account of the exantlation just mentioned. Just as we should expect, and as must inevitably be the fact, no brute animal is capable of vomiting, in which the par vagum is not sent to the pharynx, œsophagus and stomach.

3. Often considerably increased secretion from the mucous follicles of the stomach and upper part of the smaller intestines; and possibly of the gastric and pancreatic liquors; and certainly increased secretion from the liver and vesicula fells; all doubtless more or less vitiated; the whole dependent upon the involuntary motor nerve of chymical action, nutrition, etc. When moderate vomiting is produced by mere upward peristaltic action of the stomach and œsophagus, as some times in *Limosis Emesis*, there is no liquid secretion into the stomach and upper and smaller intestines, and the mere upward peristaltic action takes place slowly enough to allow us to ascertain easily that none of the thoracic muscles of expression are at all involved. When active vomiting is produced by mere upward peristaltic action of the stomach and œsophagus, the contents of the stomach are always liquid and are ejected in a continuous stream as from a syringe, and by a power of which the patient is insensible. This some times takes place when the patient is quietly lying upon the back or one side. When this mode of vomiting was more novel to me than at present, I have repeatedly kept my hand upon the thorax or the abdomen while it was taking place, without perceiving any action of the muscles of either. There appeared to be no other action even of the diaphragm, except that which was necessary to fix it. The increased secretion into the stomach in the act of vomiting is dependent upon that part of the involuntary motor nerve of chymical action, nutrition and reproduction which is sent to the secernent and absorbent or glandular system.

4. A peculiar and perhaps spastic action of all the proper muscles of expression, constituting what is called retching and straining dependent upon all of the rest of the involuntary motor nerves of expression besides those sent to the pharynx, œsophagus and

principle to found a medicinal class upon a non-medicinal power and operation; and equally so to name it on the same grounds. This is too obvious to require any argument for its enforcement. But another strong objection to the employment of these terms in connexion with this class, is the fact that they are in established use, and seem to be required in application to a morbid effect of numerous articles of the class *Adenagica*—probably a greater number than we are at present aware of. But in addition to this, the medicinal class called *Errhina*, if not identical with the class *Esstomatica*, at the very least, requires to be named upon the same principle. If we were to call the *Errhina* by the name of *Blennaogoga* (which would be in analogy with *Sialagoga* for the *Esstomatics*) it would bring two groups of articles together that are utterly unlike in their powers, operations and remedial effects, to say nothing of founding a class upon a non-medicinal power, just as we should here do, if we retained the name *Sialagoga* for the class that I am now considering. It is in fact necessary to abandon the name *Sialagoga* for this class, or to abandon all principle in nomenclature.

The terms *Salivantia* and *Salivatio* in application to this class and its effects, are the Latin equivalents of the Greek terms that I have just been considering. I need hardly say, in this place, that *Salivantia* is the neuter plural of the present tense of the participial mode of the Latin verb *Salivo to Slaver*; and that *Salvatio* is a noun-substantive from the same verb signifying *Slaving*. The verb is a derivative from the Latin noun-substantive *Saliva* which may be considered as naturalized into English. All the objections which existed in regard to the Greek terms just considered, are equally applicable to the Latin, with the additional one that they are Latin.

The only remaining term beside that which I adopt, that has been employed as a name for this class is *Masticatoria*. Latin Lexicographers of long past date explain this term as implying "*a thing to chew—to draw down the reum from the head.*" This is antiquated phraseology, and it expresses an antiquated notion; but I need not modernize either, since my definition of *Esstomatics* will answer this purpose. The Latin language has a considerable number of terms related to this, all of them derived from a Greek verb signifying *to chew*. *Massesis* is the Greek noun-

the par vagum, one of the involuntary motor nerves of expression received by the pharynx, œsophagus and stomach. Some have maintained that this nerve is also received by a small portion of the upper and smaller intestines; but this opinion seems to be founded not upon anatomical demonstration, but upon the supposed necessity for it, on account of the exantlation just mentioned. Just as we should expect, and as must inevitably be the fact, no brute animal is capable of vomiting, in which the par vagum is not sent to the pharynx, œsophagus and stomach.

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4. A peculiar and perhaps spastic action of all the proper muscles of expression, constituting what is called retching and straining dependent upon all of the rest of the involuntary motor nerves of expression besides those sent to the pharynx, œsophagus and

stomach. The process called retching or straining, or in other words, that conjoined or associated action (perhaps spastic) of all the muscles of expression through their nerves of expression, which so commonly accompanies a sudden and active paroxysm of upward peristaltic action of the œsophagus and stomach is not by any means essential to vomiting. I have seen the vomiting of Cholera Epidemica and Cholera vulgaris intirely without either retching or Nausea. The vomiting produced by the Distilled Water of Ranunculus Flammula is some times (perhaps rarely) without either. I have seen cases of Limosis Emesis in which half or two-thirds of the food taken at a meal was some times rejected in a quarter or half an hour after it was eaten, by as perfect and as pure an act of rumination as I ever witnessed in any bovine animal. In perhaps half an hour more the patient could have eaten again with quite a sufficient appetite, not as much as at first, but still a moderate meal. The subject of this case has often assured me that he did not feel even the slightest Nausea, and I have often witnessed that there was no retching, but only simple and pure upward peristaltic action. I have occasionally seen the stomach very thoroughly cleared by this process.

Some times there is violent action of all the muscles of expression constituting prominent retching and straining, without any upward peristaltic action of the stomach and œsophagus. This is commonly called vomiting; but when there is absolutely no upward peristaltic action, there can be nothing rejected, and it is not strictly vomiting, whatever it may be customary to call it. Although both Nausea and retching may occasionally exist even together and in an intense degree, without being accompanied or followed by any upward peristaltic action, and therefore without any true and proper vomiting; yet it must be admitted that the first two are seldom conjoined for any length of time, without being followed by the third. So far as the diaphragm, thoracic and abdominal muscles are concerned in the act of vomiting, the first two are certainly dependent upon involuntary motor nerves of expression, and probably also the last, though none of these nerves have ever been traced to the abdominal muscles; and yet it is notorious that they perform some functions which belong only to these nerves.

Emesis is solely and merely an action in contradistinction from

in the act of vomiting. However, most of this sort of terms are used vernacularly in two or more senses. Vomito or Vomition is a very common term, implying the act of vomiting. Vomitus is a legitimate Latin term meaning the act of vomiting. It is much less frequently employed than vomition. Its propriety is much less obvious to a mere English scholar.

Vomex is a Latin classical term signifying the act of vomiting; as is also Vomis; but they are very rarely used in medicine. Their sense or import is by no means obvious to mere English scholars.

Vomiturio or Vomiturition is a legitimate and correct term signifying a desire of vomiting from the desiderative verb Vomiturio, i. e. I desire to vomit. It is analogous to micturition a desire of discharging urine, from the desiderative verb micturio, I desire to discharge urine. Both of these are very convenient terms, and are often much needed; but, strange to tell, they are usually confounded with vomition and miction or mictus.

Definition. Emetics are articles which, when taken into the stomach, independent of odor, taste or bulk, directly and immediately produce, *first*, upward peristaltic action of the stomach and œsophagus; *second*, usually but not always a violent and perhaps spastic action of all the muscles of expression but more especially those of the trunk, which is commonly known by the name of retching, by means of both of which, but mainly of the former, there is a more or less perfect rejection of the contents of the stomach by the mouth. Associated with these, there is frequently but not always, *third*, increased secretory activity of the mucous follicles of the stomach, by means of which a thinner and more abundant effusion from these takes place; and if the vomiting is violent and protracted, the secretions from the pancreas in all probability, and from the liver certainly, are also augmented. In most cases, there is still in addition, *fourth*, more or less Nausea, either preceding, accompanying or succeeding, or the whole together, the act of vomiting.

It must be observed that there is no such thing as upward peristaltic action of the upper and smaller intestines, because the par vagum, upon which such action depends, is not sent to any parts below the stomach. Whenever any of the contents of these intestines are rejected by vomiting, they are exantlated

stomach. The process called retching or straining, or in other words, that conjoined or associated action (perhaps spastic) of all the muscles of expression through their nerves of expression, which so commonly accompanies a sudden and active paroxysm of upward peristaltic action of the œsophagus and stomach is not by any means essential to vomiting. I have seen the vomiting of Cholera Epidemica and Cholera vulgaris intirely without either retching or Nausea. The vomiting produced by the Distilled Water of Ranunculus Flammula is some times (perhaps rarely) without either. I have seen cases of Limosis Emesis in which half or two-thirds of the food taken at a meal was some times rejected in a quarter or half an hour after it was eaten, by as perfect and as pure an act of rumination as I ever witnessed in any bovine animal. In perhaps half an hour more the patient could have eaten again with quite a sufficient appetite, not as much as at first, but still a moderate meal. The subject of this case has often assured me that he did not feel even the slightest Nausea, and I have often witnessed that there was no retching, but only simple and pure upward peristaltic action. I have occasionally seen the stomach very thoroughly cleared by this process.

Some times there is violent action of all the muscles of expression constituting prominent retching and straining, without any upward peristaltic action of the stomach and œsophagus. This is commonly called vomiting; but when there is absolutely no upward peristaltic action, there can be nothing rejected, and it is not strictly vomiting, whatever it may be customary to call it. Although both Nausea and retching may occasionally exist even together and in an intense degree, without being accompanied or followed by any upward peristaltic action, and therefore without any true and proper vomiting; yet it must be admitted that the first two are seldom conjoined for any length of time, without being followed by the third. So far as the diaphragm, thoracic and abdominal muscles are concerned in the act of vomiting, the first two are certainly dependent upon involuntary motor nerves of expression, and probably also the last, though none of these nerves have ever been traced to the abdominal muscles; and yet it is notorious that they perform some functions which belong only to these nerves.

Emesis is solely and merely an action in contradistinction from

the par vagum, one of the involuntary motor nerves of expression received by the pharynx, œsophagus and stomach. Some have maintained that this nerve is also received by a small portion of the upper and smaller intestines; but this opinion seems to be founded not upon anatomical demonstration, but upon the supposed necessity for it, on account of the exantlation just mentioned. Just as we should expect, and as must inevitably be the fact, no brute animal is capable of vomiting, in which the par vagum is not sent to the pharynx, œsophagus and stomach.

3. Often considerably increased secretion from the mucous follicles of the stomach and upper part of the smaller intestines; and possibly of the gastric and pancreatic liquors; and certainly increased secretion from the liver and vesicula fellis; all doubtless more or less vitiated; the whole dependent upon the involuntary motor nerve of chymical action, nutrition, etc. When moderate vomiting is produced by mere upward peristaltic action of the stomach and œsophagus, as some times in *Limosis Emesis*, there is no liquid secretion into the stomach and upper and smaller intestines, and the mere upward peristaltic action takes place slowly enough to allow us to ascertain easily that none of the thoracic muscles of expression are at all involved. When active vomiting is produced by mere upward peristaltic action of the stomach and œsophagus, the contents of the stomach are always liquid and are ejected in a continuous stream as from a syringe, and by a power of which the patient is insensible. This some times takes place when the patient is quietly lying upon the back or one side. When this mode of vomiting was more novel to me than at present, I have repeatedly kept my hand upon the thorax or the abdomen while it was taking place, without perceiving any action of the muscles of either. There appeared to be no other action even of the diaphragm, except that which was necessary to fix it. The increased secretion into the stomach in the act of vomiting is dependent upon that part of the involuntary motor nerve of chymical action, nutrition and reproduction which is sent to the secernent and absorbent or glandular system.

4. A peculiar and perhaps spastic action of all the proper muscles of expression, constituting what is called retching and straining dependent upon all of the rest of the involuntary motor nerves of expression besides those sent to the pharynx, œsophagus and

stomach. The process called retching or straining, or in other words, that conjoined or associated action (perhaps spastic) of all the muscles of expression through their nerves of expression, which so commonly accompanies a sudden and active paroxysm of upward peristaltic action of the œsophagus and stomach is not by any means essential to vomiting. I have seen the vomiting of Cholera Epidemica and Cholera vulgaris intirely without either retching or Nausea. The vomiting produced by the Distilled Water of Ranunculus Flammula is some times (perhaps rarely) without either. I have seen cases of Limosis Emesis in which half or two-thirds of the food taken at a meal was some times rejected in a quarter or half an hour after it was eaten, by as perfect and as pure an act of rumination as I ever witnessed in any bovine animal. In perhaps half an hour more the patient could have eaten again with quite a sufficient appetite, not as much as at first, but still a moderate meal. The subject of this case has often assured me that he did not feel even the slightest Nausea, and I have often witnessed that there was no retching, but only simple and pure upward peristaltic action. I have occasionally seen the stomach very thoroughly cleared by this process.

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a sensation, and is wholly dependent upon involuntary motor nerves of expression, more especially the gastric and esophageal branch of the par vagum. When Epidemic Cholera was prevalent in the Northern parts of our country in 1832, I was myself the subject of a severe attack of this disease. I now distinctly recollect that, at the time, the stomach was powerfully emptied by successive paroxysms of very active upward peristaltic action of the stomach and œsophagus, without the least Nausea, or indeed retching, and intirely without any other sensation except that of the passage of the liquid through the œsophagus and mouth. Indeed they were suddenly spouted-out by a power which was not perceptible by means of any sensation.

The operation of the Emetics then, at least so far as relates to their proper vomitive effects merely, is dependent solely and exclusively upon the nerves of expression; and therefore I suppose they may be said to act mainly upon these. I insist particularly upon all this because it has been doubted, questioned and even denied, which led me to investigate the whole matter more thoroughly than I should otherwise have done. When I commenced my inquiries I had no opinion upon the subject, and I investigated for my own satisfaction merely. In the vomiting produced by medicinal Emetics it is probable that the diaphragm, thoracic and abdominal muscles usually perform an important part, though much more in some cases than in others; yet I do not think that they are ever in any case the exclusive agents, as has been supposed by some. There appears to me to be no sort of probability that the stomach is ever wholly passive in the act of vomiting. I believe however that there are seldom several paroxysms of active upward peristaltic action of the stomach and œsophagus, within a short period of time, without an association, in a longer or shorter time, of the expressory muscles of the thorax and also of the muscles of the abdomen; and vice versa, there are seldom several active paroxysms of that action of the expressory muscles of the thorax etc. that constitutes retching without producing sooner or later upward peristaltic action of the stomach and œsophagus; though each may undoubtedly exist for a longer or shorter time independent of the other.

I have been informed, as I think on good authority, though I have never made a conclusive number of trials of it myself, that

if an Emetic agent is preceded for a certain time by a full, or perhaps large dose of *Claviceps purpurea*, there will usually be far less retching and straining than would otherwise occur; while the actual evacuation of the stomach will be very much facilitated by it. However, it seems to operate less in proportion upon the esophageal and gastric par vagum than upon the rest of the expressory system of nerves. These facts indicate clearly enough that if *Claviceps purpurea* is pushed to the destruction of life, it must accomplish this purpose by suspending the functions of the nerves of expression, which I very well know by observations upon infants born when the mother is under the influence of *Claviceps*.

Papaver affects the operation of an Emetic in the same manner as *Claviceps*. Before I almost ceased to employ Emetics, I learned to precede them by a suitable dose of Papaver, and to select those which are not liable to be preceded, accompanied or succeeded by any material Nausea. I have often been told by patients that they would as readily take one of my Emetics, of course managed in this manner, as a cup of tea; and yet they are no less effectual for all the useful purposes of Emetics, than if they had operated ever so unkindly. It is a great mistake to suppose that an Emetic must operate roughly or even harshly in order to render the greatest service. I suppose that any of the Narcotics that operate more especially upon the nerves of expression, if they happen to possess a sufficient degree of activity, are capable of diminishing the amount of retching and straining that usually attend the operation of an Emetic, and thus rendering it kind, without lessening the thoroughness with which it evacuates the stomach or the amount of its impression upon the secernent and absorbent or glandular system. I think it is an error to estimate the thoroughness of the operation of an Emetic, and the benefit which it may be expected to render in a given disease, by the degree of retching and straining which it occasions. An Emetic that operates kindly is full as likely to benefit disease as one that operates harshly and violently.

Under the Narcotics I forgot to mention a fact that I have long known, viz. that the esophageal and gastric par vagum is the last of the nerves of expression whose functions are suspended by that group of Narcotics which destroy life by more

especial action upon these nerves. But Papaver, I believe, suspends the functions of the esophageal and gastric par vagum more readily than any other Narcotic of this section; though in cases of poisoning by it, I have readily produced upward peristaltic action of the stomach and œsophagus, after respiration could not be continued without factitious assistance, though the action of the heart was comparatively good.

Headland says that "two kinds of medicines are employed to produce vomiting, specific Emetics and irritant Emetics." "The former act from the blood; the latter by local irritation." "In the same way that irritation of the external surface of the body will some times cause at the same time the direct contraction of a neighboring muscle, and the reflex contraction of others at a distance, so does local irritation operate on the surface of the stomach." "On the one hand the muscle of the stomach itself is caused to contract so that the pylorus being at the same time forcibly closed, it tends to expel its contents in the wrong direction." "On the other hand, a large set of distant muscles is thrown into sudden action." "First a quick deep breath is taken by means of the inspiratory muscles." "Then the aperture of the glottis is spasmodically closed, so that, the lungs being full, the diaphragm can not be pushed upward." "Then immediately the abdominal muscles contract, and being unable to act on the diaphragm they press on the stomach, emptying it forcibly of its contents." "All this is by reflex action, and follows sympathetically the contraction of the stomach, coöperating with it, and resulting, like it, from irritation of the sensitive mucous surface." "Such is the action of an irritant Emetic." (*Fred. Wm. Headl. Ess. on Act. Med. in Syst. 2d Edit. Lond. 1855, Pg. 89.*)

All this appears to me to be the veriest hypothesis imaginable, and as destitute of all just foundation as any mere hypothesis to be found on the records of medicine. The power of irritating and the power of vomiting are two intirely different and distinct powers, which may occur separately or conjoined, each retaining its own specific peculiarities in either case. An irritant Emetic then is as much a specific Emetic, as a non-irritant one. When an agent possesses both these powers, the appropriate effects of each may be produced at one and the same time; but each power is as distinct as if a pure Emetic article and a pure irritant article had been taken in conjunction.

Some times an Emetic power affects only the gastric and esophageal par vagum, when it produces only upward peristaltic action of the stomach and œsophagus. Such vomiting may be active, and may empty the stomach very thoroughly, as every physician knows, who has happened to witness it in Cholera Epidemica. Some times an Emetic affects the whole of the nerves of expression in the aggregate, not only that which is sent to the stomach and œsophagus, but also those which are sent to the diaphragm, the thoracic muscles, etc. In this case, we have not only upward peristaltic action of the stomach and œsophagus and of course rejection of the contents of the stomach, but we have straining and retching, which are produced by those muscles of the thorax, etc. which receive nerves of expression. Even those muscles of the face which receive any of these nerves are involved, as any physician may satisfy himself, who will watch its expression during the operation of one of those Emetics which produces the greatest amount of retching. Some times an Emetic affects only those nerves of the expressory group that are sent to the external muscles of the thorax, etc. when we have straining and retching merely, but no upward peristaltic action of the stomach and œsophagus, and of course no rejection of the contents of the stomach. Every physician who has been in the practice of medicine for any great length of time, must have met with cases in which paroxysms even of violent retching occurred at intervals for twelve or twenty-four hours, with no rejection of any thing from the stomach. If this is not vomiting, it is some thing very nearly related to it. There are conditions which occur in pregnancy, that are quite analogous to these in relation to vomiting, so analogous as to merit formal description and comparison.

In normal parturition the contractions of the uterus are accompanied with contractions of the abdominal muscles. This is analogous to normal vomiting, which is produced both by upward peristaltic action and retching in conjunction. But when the patient has an Acinesia of the lower extremities and the lower part of the trunk (of course produced by some morbid condition of the spinal cord) parturition is performed by the action of the uterus alone, with the exception of such aid as it receives from muscles having involuntary nerves of expression. This is analogous to vomiting, which is produced by upward peristaltic action

of the stomach and œsophagus, without any assistance from the muscles of the thorax, etc. i. e. without any retching. But in some cases before the full time for delivery has come, in consequence of some great over exertion occasioning extreme fatigue, what are called false parturient efforts occur, which consist in prominent and often strong action of the external muscles without any concurrent action of the uterus, continuing occasionally for weeks, some times in a distressing degree, except when the patient is confined to a bed, or at least to a sofa, and is kept under the influence of a considerable quantity of *Papaver*. This is analogous to retching, often severe and protracted without any upward peristaltic action.

I do not know of the least evidence that what Headland calls specific Emetics i. e. non-irritant ones, operate in any manner or degree as Emetics merely, different from what Headland calls irritant Emetics. I do not know of the least evidence that the former produce vomiting by means of an action upon the blood; or that the latter vomit by means of the irritant power which they happen to possess, as appears to me, in addition to their proper Emetic power. The first impression of both is doubtless upon the inner surface of the stomach, and through that part, they some how affect the *par vagum*, which is sent to the stomach, but how minutely it is distributed to all its textures I can not pretend to tell. By means of an operation upon this individual nerve of expression, all the rest belonging to this system of nerves are usually but not always involved. This we know as a fact, which is proved by the resulting phenomena; and this is all we can say.

For my own part, I have no knowledge of Headland's supposed fact that "irritation of the external surface of the body will some times cause at the same time the direct contraction of a neighboring muscle, and the reflex contraction of others at a distance. I have no knowledge that the stomach exerts any muscular action, except downward peristaltic action dependent upon the involuntary nerve of chemical action, nutrition, etc. and upward peristaltic action dependent upon the gastric and esophageal *par vagum*. The contraction which the stomach undergoes from inanition or vacuity is the contraction of vital elasticity, and is in no way connected with the process of vomiting. I know of no such thing

as a forcible closure of the pylorus ; and if it is subject to such a state, I can not discover how it could possibly conduce to vomiting, since I consider that in this process the stomach is always evacuated by the upward peristaltic action. The supposed closure of the glottis, and the incapability of the diaphragm to act upward, appear to me to be as hypothetical as the rest of Headland's supposed parts of the process. The truth is that in the act of rejecting the contents of the stomach by vomiting, the respiratory motions must necessarily be suspended, and when they are, the lungs are usually filled before such suspension. As to the rest of Mr. Headland's rationale of vomiting, it appears to me to have no more just foundation, than that part of it which I have criticised.

Mr. Headland combats the opinion that Emetics are mere stimulants (of the stomach as I suppose) in the following manner. He says "I have heard Emetics called stimulants ; but to this I can not consent, until I see a full dose of Ipecacuanha or Tartar-Emetic make a person feel well and cheerful, and his pulse stronger while he is sick." This however he quotes from Dr. Billing's principles of medicine 5th Edit. Pg. 86 (*Ibidem* Pg. 271). Now who ever knew a stimulant "make a person feel well and cheerful while he is sick?" A true stimulant produces a quickly diffused and transient increase of vital energy and strength of action in the sanguiferous system, which may be of great importance, when the powers of this subordinate part of the system are greatly impaired, and are still continuing to wane. I have very often seen this effect in diseases of great exhaustion ; but though the stimulant made the "pulse stronger," it did not by any means make the patient "feel well and cheerful."

I suspect that both Dr. Billing and Mr. Headland failed to distinguish a Euphrenic operation from a stimulant one. I have some times heard a sick person profess to "feel well and cheerful," for the time being, under the influence of a pure and active Euphrenic intirely destitute of any true Stimulant i. e. Antisbestic power. De Quincy very certainly mistakes the Euphrenic power of Papaver for a stimulant one. I do not think that this latter gentleman ever took cognizance of the true stimulant power of Papaver. Whenever he refers to it, his specifications always show that he mistakes its Euphrenic power for it. But there are great-

er mistakes than this in his account of this article. I do not consider vomiting as the effect of a stimulant operation either upon the stomach, or any other part of the system, any more than Mr. Headland does; but I do not consider any argument necessary for the disproof of this opinion.

Dr. Good being one of the few medical writers who has attempted to discriminate the different qualities of Emetics and of their operation, I shall quote him freely, making such comments as his remarks seem to require. I do this in part, because my own attempts to do the same thing have been disparaged and pronounced to be without foundation. My quotations from Good, whether I agree with him or not, will at least show that I am not alone in doing this. Dr. Good considers Nausea and vomiting as only "two stages of one and the same" process. (*Good's Stud. Med. 4th Amer. Edit. Boston 1826 Vol. 1, Pg. 149.*) I have already shown that Nausea and vomiting are intirely different things, the one being a pure sensation and having its seat in certain nerves of common sensation, the other being a pure motion or action and having its seat in certain nerves of involuntary motion. The two are not even essentially connected.

Dr. Good says "Nausea lowers the pulse, contracts the small vessels, occasions cold perspiration, severe rigors and trembling, and as long as it lasts, diminishes the actions and even the general powers of life." (*Ibidem Pg. 149-50.*) What is meant by lowering the pulse? Does it mean diminishing its strength, which Nausea always does; or does it mean diminishing its frequency, which Nausea some times does and some times fails to do? Such loose and equivocal language should always be studiously avoided by every author who desires to be readily and correctly understood. "The act of vomiting on the contrary," (says Dr. Good) "rouses rather than depresses; puts to flight all the preceding symptoms and restores the system to itself." (*Ibidem Pg. 150.*) Whether the act of vomiting arouses or not depends upon the general condition of the system at large when the Emetic is taken. When a patient labors under a truly entonic or phlogistic disease, the act of vomiting aggravates it greatly. I do not know whether Good would call this rousing or not. When a patient is in a state of prostration with much torpor and insusceptibility, the act of vomiting, provided it is accomplished with a well

chosen article, usually brings him happily out of this state. When a patient is in a state of very considerable exhaustion generally, which, unhappily for their employers, very many physicians confound with and call prostration, the act of vomiting is much more likely to reduce him to the article of death, than to arouse him in any manner. During the prevalence of Typhus Syncopalis, and other diseases of extreme exhaustion, in the State of Connecticut, between the years 1806 and 1809, I knew a considerable number of cases thrown into a dying state by Emetics insisted on by counsellors not conversant with the disease—cases that promised recovery without the Emetic as much as one half that actually recovered. It may perhaps be said that the physician in attendance, who was experienced in the character and habitudes of the disease, should not have followed advice that he well knew would be fatal to the patient. He could not however help himself, for those counsellors not acquainted with the disease would often violate all the rules of consultation, and appeal to the prejudices of the bystanders and friends who would overrule the physician in attendance.

"There are few persons" (says Dr. Good) "so debilitated as not to bear vomiting, but many who would sink under Nausea." (*Ibidem* Pg. 150.) The very fact that Dr. Good makes such a remark as this, without any qualification, sufficiently indicates that he never could have been conversant with diseases of extreme constitutional exhaustion. If he had only had opportunity to practise for twenty years upon such diseases as occurred in the Milbank Penitentiary, I doubt not but that he would have modified this remark very materially. "It is obvious therefore" (continues Good) "that these two different states of the stomach may be employed as powerful instruments in attacking a variety of general, and even remote local diseases; this organ being justly considered as the common center of sympathy, and producing opposite results, according as it is excited to different modes or degrees of action." (*Ibidem*.) No doubt but that both Nausea and Vomiting are powerful in their influence upon the system both in health and disease; but as I have already said, they are by no means different grades of one and the same operation. Nausea should be employed only in entonic or phlogistic diseases, or in the effects of certain casualties which do not impair the healthful

energies of the system at large, as for example, perhaps in certain Dislocations and perhaps at the commencement of Incarcerated Hernia, etc. but then it is of very considerable importance what Nauseating article is selected for such purpose. It should always be an agent by which we can readily produce and keep-up a sufficiently intense Nausea without vomiting, and without producing any other effect which is not desired. As much injury has been done by an injudicious selection of Nauseating articles, as by the ill adaptation of the method of treatment to the circumstances of the case and the general condition of the patient.

Good says "as Nausea diminishes the action of the system generally, and particularly that of the small vessels, it has often been had recourse-to with success in Inflammation of different organs, particularly of the eyes and lungs; as it has also, on the approach of the first Fit of Intermitting Fevers, or the accession of those of a continued type, and that threaten a considerable degree of violence." (*Ibidem.*) What is here intended by diminishing action? Continuous and protracted Nausea doubtless diminishes strength of action in the sanguiferous system, and possibly in other subordinate parts of the animal economy, though I do not know of any other part of which we have a measure of its strength of action. But, by diminishing action, medical writers generally mean diminishing the frequency of the systole and diastole of the heart and arteries, as indicated by their pulsation. Now I have seen this both diminished and increased by Nausea. A Nauseated patient lying quietly upon his back will (some times at least) have the frequency of his pulse considerably diminished; but if this same subject rises and makes considerable exertion, his pulse will some times, if not generally, be considerably increased in frequency, as before they were diminished. The frequency with which the whole mass of blood goes the round of the intire sanguiferous system does not depend upon increased frequency of the systole and diastole, but rather upon increased strength of the systole. I think there can be no reasonable doubt that the whole mass of the blood is carried the intire round of the circulation oftener in an entonic or phlogistic disease, in which the pulse may not exceed ninety or one hundred in a minute, than in a very atonic one, in which the pulse is a hundred and twenty or a hundred and thirty.

But there is another important effect of Nausea. As it weakens the action of the heart, it necessarily disturbs the balance of the circulation between the external parts and the internal ones, since weakening the action of the heart, while atmospheric pressure remains the same, the quantity of blood in the superficial vessels must necessarily be diminished, while that in the internal vessels must necessarily be increased, much more especially in the head which is surrounded by an impermeable bony paries. Now Inflammation or Phlogosis does not consist essentially either in increased strength of the systole and diastole of the arteries of the Inflamed part; increased rapidity of the circulation of the blood in such part; or increased frequency of the systole and diastole of the arteries of such part. But there is always a preternatural congestion of blood in the vessels of an Inflamed part, as is commonly supposed, occasioned by a greater or less diminution of tone in these vessels and consequent inability to resist the vis a tergo. I doubt however about the correctness of this explanation, since Phlegmonous Phlogosis is some times entonic or phlogistic, and some times atonic, while all other species of Phlogosis are either positively atonic, or sometimes atonic and some times neither atonic nor entonic, but never entonic, the congestion of blood being just about the same, in each of these conditions. This seems to indicate that such congestion of blood is essentially Phlogotic, i. e. essential to Phlogosis whether entonic or atonic or neither.

From these considerations, it would seem a priori, as if Depletion of Blood, so far as it diminishes the mass of the circulating fluid, must diminish to a certain small extent all Phlogosis; while as far as it weakens the action of the heart (which it always does to a considerable extent) leaving atmospheric pressure the same, must abate external and superficial Phlogosis, while it must increase internal and visceral Phlogosis, more especially within the cavity of the skull. But facts as determined by observation and experience, are intirely at variance with the conclusions from this reasoning; for I consider that there is nothing more certain in the whole practice of medicine, than that Depletion of Blood relieves all entonic or phlogistic Phlogoses, while it aggravates all atonic ones, and the more in proportion to their degree of atony. Nausea would seem to be as purely an exhausting process as Depletion of Blood, and consequently it must be indicated and con-

traîndicated by the same pathological conditions and symptoms. It can no more be a specific for all the species and varieties of Phlogosis than Depletion of Blood.

I certainly very well know at least ten or a dozen unequivocally different and distinct species of Phlogosis, not to mention varieties of these several species; and in all probability there are a few more, whose characters, on proper investigation, will be found to be permanently distinctive or diagnostic. Only one of these species is known to occur in an entonic state; an atonic one; and a state which is neither of these. Of the remainder, some are always atonic, while others are some times atonic and some times neither entonic nor atonic. One at least, and perhaps more, is never either entonic or atonic. Nausea like Depletion of Blood always produces a greater relative determination of blood to the viscera, and in this way, in all probability, is more or less injurious to all the atonic visceral Phlogotica.

As Intermittent is always an atonic disease, and is invariably best treated by those Tonics, the primary manifestations of whose operation are in the sanguiferous system, Nausea, which is so opposite to its operation and effects is always most decidedly a bad measure, and one which, at the least, invariably does some injury, making the disease more difficult to cure immediately and without liability to relapse. This is not the place however to particularize in regard to Intermittent. Suffice it therefore to say that I never happened to know that accomplished by Nausea which was expected of it, while not only this, but more may be accomplished by less objectionable means, or more correctly by means in no respects objectionable.

I have certainly witnessed a very considerable amount of mischief, and never any benefit, from protracted Nausea in atonic Continuous Fevers, some times more and some times less, according to the agent employed for its production. Of all the agents employed for this, the Antimonials are the best for entonic or phlogistic diseases, and the worst for atonic diseases. I shall soon quote an author to this same effect; although he would seem to attribute the evil to the Antimony employed as the Nauseating agent. But this is not the place to treat of the Nausiatica. I have been compelled to say this much on account of its frequent association with vomiting.

Good says "full vomiting, by augmenting the general action, and consequently giving great additional energy to the absorbent system, has also been very advantageously employed to remove Inflammation, though in a different manner; and particularly Inflammation of the suppurative kind." "Orchitis and Purulent Ophthalmia have often yielded to it as a charm; and we have various instances in which the fluid of extensive Abscesses has been hereby carried-off in a few hours." "From the pressing violence of the action, it has also been beneficial in many cases of Obstruction or Chronic Torpitude; and hence its occasional utility in Amaurosis and Caligo; and still more so in Congestions of the liver, and other abdominal viscera." (*Ibidem* Pg. 150. What does Good mean by "augmenting the general action?" Vomiting assuredly does not increase vital energy and strength of action generally, which really ought to be what is intended by this language. It may be said however, to obviate torpor and insusceptibility or (in one word) prostration, and to increase activity when there is no material amount of exhaustion. This is probably what Good means by "augmenting the general action," and it certainly is such. But this phrase is equivocal, like too many in constant use by medical authors.

I have no knowledge that vomiting ever gives any "additional energy to the absorbent system" or any other subordinate part of the animal economy; and yet it commonly increases activity both of the secernents and absorbents, when there is no great exhaustion. But there is a very material difference between "giving great additional energy" i. e. additional power and strength, and merely increasing activity. Increased activity is by no means incompatible with diminished energy, power or strength, and it might be very unfortunate in many cases, not to distinguish "augmented energy" from increased activity. It is undoubtedly by means of producing increased activity (not "great additional energy") of the secernents and absorbents, that vomiting may often be made to produce a resolution of certain Phlogoses. It is not however Phlegmonous Phlogosis (what I suppose Good intends by Inflammation of the suppurative kind) over which vomiting exercises the greatest control, but rather Rheumatismal Phlogosis, which never suppurates. But Phlegmonous Phlogosis is some times capable, perhaps often, of direct resolution by the

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Good says "full vomiting, by augmenting the general action, and consequently giving great additional energy to the absorbent system, has also been very advantageously employed to remove Inflammation, though in a different manner; and particularly Inflammation of the suppurative kind." "Orchitis and Purulent Ophthalmia have often yielded to it as a charm; and we have various instances in which the fluid of extensive Abscesses has been hereby carried-off in a few hours." "From the pressing violence of the action, it has also been beneficial in many cases of Obstruction or Chronic Torpitude; and hence its occasional utility in Amaurosis and Caligo; and still more so in Congestions of the liver, and other abdominal viscera." (*Ibidem* Pg. 150. What does Good mean by "augmenting the general action?" Vomiting assuredly does not increase vital energy and strength of action generally, which really ought to be what is intended by this language. It may be said however, to obviate torpor and insusceptibility or (in one word) prostration, and to increase activity when there is no material amount of exhaustion. This is probably what Good means by "augmenting the general action," and it certainly is such. But this phrase is equivocal, like too many in constant use by medical authors.

I have no knowledge that vomiting ever gives any "additional energy to the absorbent system" or any other subordinate part of the animal economy; and yet it commonly increases activity both of the secernents and absorbents, when there is no great exhaustion. But there is a very material difference between "giving great additional energy" i. e. additional power and strength, and merely increasing activity. Increased activity is by no means incompatible with diminished energy, power or strength, and it might be very unfortunate in many cases, not to distinguish "augmented energy" from increased activity. It is undoubtedly by means of producing increased activity (not "great additional energy") of the secernents and absorbents, that vomiting may often be made to produce a resolution of certain Phlogoses. It is not however Phlegmonous Phlogosis (what I suppose Good intends by Inflammation of the suppurative kind) over which vomiting exercises the greatest control, but rather Rheumatismal Phlogosis, which never suppurates. But Phlegmonous Phlogosis is some times capable, perhaps often, of direct resolution by the

act of vomiting, if produced by the appropriate agent and managed in the best manner. But who would treat a Phlegmonous or indeed any other Phlogosis of the viscera of the cranium with Emetics or vomiting? Is Purulent Ophthalmitis, whether of infants or adults, to be trusted to vomiting? Some cases of Orchitis, I very well know, will occasionally yield to it. I have sometimes known vomiting occasion the absorption of pus from an Abscess; but I believe that it much oftener fails of producing this effect. As to the effect of vomiting upon obstructions of the viscera, I have nothing to say, since I could never find-out what is intended by this name. I never witnessed the obviation either of Caligo Lentis or of Amaurosis by this process, and I can hardly believe that either of them when genuine has been so removed. I very well know that torpor and insusceptibility without any material exhaustion, may often be obviated by appropriate vomiting.

Good says "as different Emetics produce not only a different action on the stomach, but also on the system at large, or different parts of it, they are by no means to be used indiscriminately, but in reference to the particular object we have in view?" "This difference of effect depends upon the peculiarity of their Emetine, as the French writers denominate it, or" (the) "Emetic principle of which we require further instruction than has been obtained at present; though the experiments of Messieurs Magendie and Pelletier have given us some information concerning this principle as it exists in the brown Ipecacuanha" (or) "Psychotria Emetica, the gray" (or) "Callicocca Ipecacuanha, and the white" (or) "Viola Emetica." (*Ibidem* Pg. 150-51.) A part of the preceding paragraph requires explanation and comment in this place, which may well precede the more essential remarks. Good here speaks of Emetina or Emetine as if it were the sole Emetic principle of all vegetable organic substances, and as if all the peculiarities of the different vegetable Emetics depended upon some slight variety of this single Emetic principle. The truth is that this principle was obtained from Cephælis at a period when chimists fancied that there was in fact but one principle for each power in the materia medica. At this period chimists spoke of the Bitter principle, the Narcotic principle, the Emetic principle, the Cathartic principle, etc. as if there were but one for each

of these powers. While such notions and such language were prevalent, it happened that the active principle of *Cephaëlis*, and also the active principle of one of the species of the genus *Cassia* were obtained in a separate state; and in conformity with the then prevalent notions they were immediately named *Emetina* or *Emetine* and *Cathartina* or *Cathartine*. Their Alcaloidal character was not then even suspected. As soon as it was ascertained that there was a plurality of Emetic and Cathartic principles, the above names should have been immediately changed to *Cephaëlina* or *Cephaëline* and to *Cassina* or *Cassine*. But although there is a plurality of Emetic and Cathartic principles, yet it is altogether probable (I believe in fact proved) that several nearly allied Emetics contain this same principle, such as several other species of *Cephaëlis*, *Psychotria*, etc. These and a considerable number of other Emetic articles all belong to the natural order *Cinchonaceæ* and are nearly allied botanically. There is a considerable number of Emetic species of the natural order *Violaceæ*, all of which have been said to contain a greater or less amount of an Emetic principle, which has been called *Violina* or *Violine*. Species of *Pombalia*, *Ionidium* and *Viola* might be mentioned as examples. Of late however, *Violine* has been said to be identical with *Cephaëline*. What the true fact may be, I have no means of knowing with certainty. I suppose that all the Cathartic species of true and proper *Cassia*, perhaps excluding *Cathartocarpus* and perhaps not, depend upon *Cassine* for their Cathartic power. Several of the articles that bear the trivial name of *Ipecacuanha* undoubtedly contain the same active principles; several, though containing a specifically distinct active principle, have one that is very like *Cephaëlina* or *Cephaëline*, while others contain one which is doubtless widely different. No one well acquainted with the operation of *Euphorbia Ipecacuanhæ* can for a moment suppose that it contains *Cephaëline* or any thing like it.

The peculiar qualities of the mere act of vomiting are almost as numerous and as various as the different individual Emetics. The whole of these peculiarities can not always be adequately described in words, though much the greatest number may be, and with the rest we may become so familiar by careful and accurate observations, as to know at once when any one or more of them is contraïndicated in a given case. These qualities should

always be regarded in the selection of an article for a particular case in a particular subject. But the consideration of the peculiar quality of the act of vomiting, as produced by each individual Emetic, does not belong to the proëm to the class Emetica, but to the account of the article itself. Only a few articles can be specified by way of illustration.

Again, the additional powers possessed by each individual Emetic article merit thorough knowledge, since in a given case, in which an Emetic is indicated, these may also be indicated or strongly contraïndicated; and at all events, an Emetic with several different and distinct powers, when employed as an Emetic, must produce quite a compound and complex effect, materially diverse from that of a mere or pure Emetic. Good says that "the Squill and Seneka-root act very generally, proving not only Emetics but Cathartics and Expectorants." (*Ibidem* Pg. 151.) That these articles act in a greater or less degree as Cathartics is scarcely a peculiarity of these two agents, since a large proportion of all the Emetics do so. These however are active Hydrogogue Cathartics, which is by no means true of ordinary Emetics. This is a peculiarity highly important to be known. These articles are capable of proving Expectorant, or more correctly Blennagogue, but this is only a part of a more general operation upon the whole secretant and absorbent or glandular system, the operation which I have already treated of under the name of Adenagic. A much more extensive and discriminating knowledge of these two articles is necessary for their best use. Good is however right in associating them together as very nearly analogous articles, which may not infrequently be used as substitutes for each other. As I purpose bye and bye to specify the peculiarities of Urgenea Scilla, by way of illustration, I shall say nothing more of it in this place.

Good says that "Asarum which was once extensively employed for vomiting, both in its roots and leaves, at the same time that it inverts the stomach, acts very powerfully on the olfactory nerves and becomes a pungent Emetic." "It is hence by far the best Emetic we can select in affections of the eyes, and several species of Cephalæa." (*Ibidem* Pg. 151.) An article with a very offensively fetid smell might produce vomiting from the disgusting character of its odor; but this would not be medicinal vomiting and such vomiting is excluded by my definition. What medic-

inal effects could be produced by vomiting occasioned by the stench of a great mass of putrid cabbages, or by half a dozen putrid human carcasses? Good's notion that because this article (the root principally as I suppose) is more or less aromatic, it must act powerfully upon the olfactory nerves and thus become a pungent Emetic; and that on account of this action upon the olfactory nerves, it must therefore be "by far the best Emetic we can select in affections of the eyes, and in several species of Cephalæa." I look upon this as mere moonshine. The root of *Acorus Calamus* will vomit if a sufficient quantity of it is swallowed at once; but there is not the least reason to think that its odor modifies the character of its Emetic operation, or renders it in any degree more appropriate for the relief of diseases of the eyes, or of the head. Good's notions upon this subject seem to me to be truly anile. Emetics must be selected for particular cases, upon better principles than these. But I can only call attention to the absurdity of Good's notions and leave the subject to be treated of in another place. Good's account of *Asarum Europæum* is altogether inadequate as a guide to its discriminating use as an Emetic.

Good says "the *Vitrum*" (*Antimonii*) "and *Crocus Metallorum*, the more powerful preparations of Antimony, and the Sulphate of Zinc and Copper are probably simple stimulants also, but of a high degree of activity." "They act on the stomach almost as soon as they are introduced, and hence are peculiarly eligible for a rapid expulsion of poisons that have been taken inadvertently." "If taken however in too large a dose, they become quite as mischievous as any Poison they are intended to remove, for they prove violently corrosive to the coats of the stomach and excite *Hæmatemesis* or Vomiting of Blood." (*Ibidem* Pg. 152.) Good, as well as writers on *materia medica* generally, supposes that all classes of medicines operate by stimulating the parts in which are the first manifestations of any of their effects; but this can not be Good's meaning in the present case, because he begins by saying that these preparations possess a high degree of activity as Emetics, to which he adds that they "are probably simple stimulants also, of a high degree of activity." *Vitrum Antimonii* and *Crocus Metallorum* stimulants!! Then of course they must be very bad articles for the treatment of all entonic or phlogistic

diseases, and must be well adapted to relieve all diseases of exhaustion, malignant ones especially, whether acute or chronic. A distinguished medical professor and author of the U. S. A. in a note to a republished foreign work (to which I can not now refer) says to the effect that it is one of the most important points in practical medicine to know when to administer exhausting and Antiphlogistic agents, and when Antisbestic or truly stimulating ones. If this is true, it must assuredly be equally important to know when a medicine is actually exhausting and when it is Antisbestic. In what cases however does the great body of the profession prescribe these articles? Before both of them were superseded by a better article possessing exactly the same powers, they were invariably administered in all the most exquisitely entonic or phlogistic diseases that ever occurred; and I have no knowledge that any question was ever made as to the propriety of this course. If these agents are appropriate to entonic or phlogistic diseases, can they possibly be beneficial in such cases as Jail, Ship or Hospital Fever, in the Typhus Syncopalis of Massachusetts and Connecticut, in Enanthesis Rosalia, or in any of the chronic diseases, in which what are called Stimulants and Tonics are commonly prescribed? But are Protosulphate of Zinc and Protosulphate of Copper either stimulant or Antiphlogistic? I insist that they are not, while the Antimonials are among the most active articles of the latter class. Assuredly no article can be stimulant and Antiphlogistic at one and the same time, i. e. directly producing a quickly diffused and transient increase of vital energy and strength of action, and so great a diminution of vital energy and strength of action as to counteract and obviate entonic or phlogistic diathesis. These two articles have no affinity or analogy with the Antimonials, with which Good associates them, any further than that they are capable of vomiting. They are even Emetics of a very different character. The Antimonials and Protosulphate of Zinc can not, in my opinion, be considered as quick Emetics, though without doubt, the Protosulphate of Copper may very properly be. But as I expect to specify the characters and peculiarities of both Protosulphate of Zinc and Protosulphate of Copper by way of illustration of the principles inculcated in this proëm, I will say nothing further about them in this place.

Good mentions "some of the Alkaline Salts" as Emetics; and he says that they act in the same manner as the Sulphates of Zinc and Copper, Vitrum Antimonii and Crocus Metallorum. He says "when taken in excess, they throw not only the stomach but other parts of the system into violent Spasmodic motions." "Two ounces of Niter were taken by mistake for one ounce of Epsom Salt." "An almost incessant vomiting for two days was the result, accompanied with a copious discharge of grumous blood from the excoriated mucous membrane of the stomach, notwithstanding that very large quantities of warm water were repeatedly drank, and alternated with equal quantities of Gruel and Mucilage of Gum Arabic, to defend the surface of the stomach by an artificial Mucilage." "Mr. Buller, who relates this case, informs us that the patient recovered, but was long afterwards subject to chronic Spasms resembling Chorea." (*Ibidem* Pg. 152-3.) When I began to read this paragraph for the first time, I could not conjecture what Alkaline Salt there was that could possibly be Emetic; and the thought occurred that as Tartrate of Antimonia and Potassa contains an Alkali, Good might possibly have the whim of calling it by that name. Great was my surprise when in the course of a few lines I found that Nitrate of Potassa was intended. The Tincture of Cantharis might just as well have been named as an Emetic. Both Nitrate of Potassa and Tincture of Cantharis possess an Oresthetic power, and in a dose sufficiently large will produce an Erythematic Phlogosis of the lining mucous membrane of the stomach and upper intestines, under which, as under idiopathic or rather spontaneous Phlogosis of this texture, there will be frequent vomiting. This seems to be the supposed Emetic power to which Good, by his own account has reference. Can it be possible that this author ever supposed that such vomiting could ever be remedial, and if not, how should he mention it as he does? I will here remark by the bye, that it is surprising how little seems to be known of the powers and most important applications of Papaver. Had this agent been properly used, and the drenching with warm water omitted, which undoubtedly injured by its mechanical effects, this patient might have recovered much more speedily. I have had occasion to treat more than one case in which an ounce of Nitrate of Potassa had been taken for an ounce of Sulphate of Soda, so that I very well know what Papaver will do under such circumstances.

the slowness of its operation. When I speak of this slowness let me not be misunderstood. I always measure this by the smallest dose that will in its own time operate thoroughly and effectually in a subject of ordinary susceptibility, and not of any peculiar habit of body. If taken in full or rather large Emetic doses, its operation makes quite a strong, but not an exhausting impression, and gives what, for want of a better term, may be called quite a shock to the system. On this account merely, it would be well adapted to the production of a sudden resolution of all those diseases that are capable of being thus resolved by Emetics. In some cases, its slowness of Emetic operation is an objection to its use for this purpose; but in others, it is an advantage. It is very effectual for the production of a resolution of certain atonic Phlogotica, not only on account of the quality of its Mercurial Adenagic powers, but, I am inclined to think, on account even of its slowness of operation. Croup may be mentioned as an example.

It possesses considerable power of obviating torpor and insusceptibility or prostration; but is not very eligible for this purpose on account of the slowness of its operation. But let it not be forgot that the smallest quantity, not only of this, but of every other evacuant article that will ultimately operate fully and effectually, though only after a considerable time, is always to be reckoned a full dose, and furnishes the measure of the slowness or speed with which the article is to be reckoned as naturally operating. The custom of reducing the time of the operation of all evacuant medicines to exactly the same standard by greatly increasing the dose of the slow agent is hazardous and usually productive of much and great evil. All the non-acrid and non-irritant Mercurials, as well as this, are always truly slow in their evacuant effects. Protochlorid and Protocyanid of Mercury, which are acrid and irritant, are quick in their evacuant effects, while the Disoxyd and Dichlorid, which are non-acrid and non-irritant, are slow in their evacuant operation. These examples will well illustrate my rule.

As an Emetic the Protosulphate of Copper stands in very much the same relation to the Tartrate of Antimonia and Potassa that Ranunculus Flammula stands in to Cephaëlis Ipecacuanha. It is quite effectual in its vomitive operation, which consists far more in upward peristaltic action of the stomach and œsophagus than

capable of producing an Erythematic Phlogosis of the mucous membrane of the stomach and upper intestines, like Nitrate of Potassa, of course attended with more or less vomiting, especially when any thing is swallowed. But which of the six articles that have been called Prussic Acid will do this? Which of them deserves to be reckoned an Emetic, in any legitimate acceptation of this term? When I first read what I have just quoted and am now commenting-upon, I could not but feel that I must be laboring under some great mistake in regard to Good's meaning. But time has not cleared-up the mystery.

Dr. Good says that "hot water operates only as a simple stimulant to the stomach, and hence, unless there are other irritants in its cavity, rarely takes effect till the stomach becomes distended, and the nervous fibers of the pylorus are inordinately excited by the quantity swallowed." "If however we infuse in the hot water a certain portion of Horse Radish" (*Nasturtium Armoracia*, *Fries*) "Mustard-seed" (*Sinapis alba*) "the root of Mezereum" (*Daphne Mezereum*) "or a handful of Chamomile-flowers" (*Anthemis nobilis*) "we increase its stimulant power, and a much smaller quantity is sufficient." "It is probable that all these substances act in like manner as simple stimulants alone, for in small doses they tend rather to take off, than to excite sickness." (*Ibidem* Pg. 151-2.) I consider it as absolutely certain that hot water is neither a simple stimulant, nor a true and proper Emetic. So much of it may be taken as to be offensive by its bulk, which will some times cause it to be rejected by upward peristaltic action of the stomach. That it will vomit with the least certainty or uniformity, or in any considerable number of cases, is contrary to all my observations; but the notion that it is in any degree truly stimulant seems to me to be preposterous, much more so than the notion of its Emetic power. If an Emetic agent is added to it, in sufficient quantity, vomiting will result, though not from the water but from the Emetic added. When the stomach is perfectly empty at the time of taking an Emetic, swallowing a considerable amount of water will give the stomach some thing to act-upon, and thus render the process easier.

Good says "there is little doubt that" (atmospheric) "air operates in the same way" (as water) "for some persons, as Mr. Goss of Geneva, by swallowing air and distending their stomachs with it, are

crystallization, and of course in powder, is the best form for exhibition. As the pure powder inclines to concrete into a mass, I keep it rubbed thoroughly with an equal weight of the powder of the root of *Cephaelis Ipecacuanha*, which prevents such concretion. This admixture interferes in no respect with its operation, either as respects speed, efficiency, kindness or degree of Nausea. As far as it goes, the *Cephaelis* assists the Copper though it would be no adequate substitute for it.

The principal power of *Urginea Scilla* (*Steinhil*) or common Squill is that of an Emetic. It is also Nausiatic, Cathartic, Adenagic, Oresthetic when recent, and Exhausting, but not the latter to a sufficient degree to render it Antiphlogistic, and yet enough so to cause it, when much or long used, to impair the tone of the alimentary canal far more than is desirable. It operates about equally upon the stomach and œsophagus and upon the diaphragm, thoracic and abdominal muscles. In a sufficiently full dose it empties the stomach effectually, and in about a medium time, without any distressing degree of retching and straining, or even Nausea. It usually proves more Hydragogically Cathartic than is desirable for most cases. It may be made to produce a sufficiently strong shock, or impression upon the system at large; but never the less, it is ill adapted to the purpose of obviating torpor and insusceptibility or prostration, because it is too much Exhausting, too much Nauseating and not sufficiently kind in its operation to be a very eligible article for such a purpose. From the mere quality of its Emetic operation, it is not very eligible for the purpose of increasing the activity of the secernents and absorbents or glandular system; but as it is an Adenagic of considerable power, it has more efficacy for the production of a resolution of certain Phlogotica than might otherwise be expected. At one period of my practice, my professional neighbors employed it as an Emetic and resolvent in most cases of Croup, and not without very considerable success as respects the resolution of the topical Phlogosis; and I tried it often myself; but its sequels, though much less dangerous, were reckoned to be so very troublesome, that the article with me fell into disuse. I never knew a physician who continued to treat Croup with it, throughout his professional career.

Urginea Indica is said on good authority to be a perfect substitute for the European *Urginea Scilla*. *Eryngium Yuccifolium*,

both plants, availed himself of it as a remedy for Agues and Parabismic tumors of the liver." (*Ibidem* Pg. 154.) But will these articles, or any other, vomit with sufficient certainty, and without any material inconvenience, by topical application to any part of the surface of the body? I have seen Tobacco applied to the skin for this purpose, but I never knew it vomit till it had produced an undesirable degree of Ultimate-Narcosis, and then the vomiting was of that character which results from Ultimate-Narcosis merely, since it took place only on motion or exertion, or being raised into an upright position, and it was wholly ineffectual for all the medicinal purposes of vomiting. From a continuous and protracted application of a sufficient quantity of Oil of Pavana, I have known Diarrhœa produced with that sort of vomiting which often attends Diarrhœa; but I never could perceive any medicinal benefit from such vomiting. Perhaps I have never made a sufficiently thorough trial of the external application of *Senecio vulgaris*; but when I have tried it, it has invariably failed of vomiting. But I have been unable to find this plant recently. In my boyhood, I remember it as a common weed in the gardens of my native place, on the sea-shore of Connecticut, though at present it seems to be eradicated. Its seeds were undoubtedly brought from England, in the matter used for packing crockery in crates. In my opinion, the only reliable mode of taking Emetics is to swallow them into the stomach. A man need not be a prophet to foretell that this good old method will always supersede applying them to the skin, or injecting them either into the rectum, the urinary-bladder or the blood-vessels.

Tartrate of Antimonia and Potassa is one of the most violent and harsh Emetics in the materia medica. It requires only a medium time for its operation, provided only an ordinary full dose is employed. Some times when an inordinate dose is taken by mistake, it fails intirely of vomiting in any degree. In such circumstances, the very large dose immediately produces so great a degree of Neuragic effect as to transcend and supersede any Emetic operation. In such cases there is often even no Nausiatic effect, this operation also being transcended and superseded by the Neuragic effect. A large proportion of its Emetic operation consists in the action of the diaphragm, the thoracic and abdominal muscles, and hence

By the phrase "excite the stomach" Good here means vomit. Every thing that influences the animal economy in any way is now said to excite it. If a man is horribly frightened, he is excited; if he is drunk he is excited; if he is in a great rage, or what is some times called "a towering passion," he is excited; if he is under the influence of an active Antisbestic, he is excited; if he is under intense Nausea from Antimony, he is excited. I was once well acquainted with a physician who used to speak of exciting his Dyspeptic patients in this manner, by Tartrate of Antimonia and Potassa. It was certainly well said by some body that language is used, if not given to us, for the purpose of concealing our thoughts. But in this case assuredly, to "excite the stomach" means to vomit.

I never could detect the least evidence that Cephaëlis is either Blennagogue or Expectorant. As an Emetic this article is sufficiently certain and mild, and yet effectual for a number and variety of cases, though certainly not for all. It very rarely operates excessively, because even when it is taken in an inordinate quantity, it is always, or very nearly always rejected in the first paroxysm of vomiting, which prevents any excess in its Emetic effects. Some times when an Emetic of Cephaëlis is very inappropriately employed in an exquisitely susceptible and irritable case, where all Emetics are grossly improper, it will operate harshly and unkindly; but this does not depend upon the qualities of the Emetic, but rather upon the condition of the patient. It is of very little value for the obviation of torpor, insusceptibility or prostration. It gives only a feeble shock, or in other words, makes only a weak impression upon the system at large, and therefore is of small importance for the resolution of acute Pyretic or Phlogotic diseases at their outset, or in their forming stage. In many cases, it answers sufficiently well for the evacuation of noxious or deleterious substances from the stomach, at least when a new dose is repeated several times after the paroxysms of vomiting. In some cases however it is utterly inadequate for such a purpose, particularly where the noxious or deleterious substance produces great torpor or insusceptibility. It exerts no exhausting influence except what inevitably results from the mere act of vomiting in an extremely atonic disease.

From the allusion already made to the Distilled Water of Ran-

bad habit, and nothing else. When I say this, I would not be understood as at all undervaluing it in non-emetic doses as an Antiphlogistic; though the fact that entonic or phlogistic diseases have disappeared from among us for the present, renders this article of very little importance for that purpose till they again recur, which they will doubtless do at some future period.

Dr. Good says that "the Antimonial Emetics, in a full dose, act more violently upon the stomach, bowels and skin, but less upon the mucous secernents." "While, in small doses, the Nausea they produce is accompanied with the most deadly languor, and with an atony, that, in numerous cases, has been succeeded with more mischief than any degree of benefit that could have been proposed by their use." "Many in this manner" (says Dr. Perceval of Dublin, in his manuscript remarks on the volume of Nosology) "have sunk under Nauseating doses of Emetic-Tartar, employed upon the hypothesis of Dr. Cullen in low Fevers." "The heart of a Frog is so torpified by this Antimonial, as not to be excited by Galvanism, which is not the case with Opium." "The fraction of a grain of Tartar-Emetic in a Gouty habit, subject to Melæna and Palpitation, produced an alarming Deliquium." "In the same subject, a similar effect attended the use of other Antimonials. (*Ibidem* Pg. 151.)

This is a very loose and vague statement, but it arrives at a general result, which is on the whole correct. By "acting more violently upon the stomach, bowels and skin," I suppose that Good means that Vomiting, Purging and Sweating are its principal operations. This is doubtless true of the first two of these, but not of the third. For myself, I have long been well satisfied that this article is never directly, i. e. truly and properly Diaphoretic. Prevalent medical opinion in regard to this last effect doubtless resulted from witnessing its use in entonic or phlogistic diathesis, in which, if it proved Diaphoretic (as doubtless it did some times) it must have done so merely by obviating the entony in which mode it can not possibly act in atonic diseases. In fact I can not conceive it possible for any individual article to be directly Diaphoretic both in entonic or phlogistic and in atonic diathesis; and this agent is certainly adapted to the treatment of the former, and therefore can not possibly be, to the treatment of the latter. So far as increasing any of the fluid excretions is concerned, there

is no evidence that this article is at all Adenagic. Adenagics are not at all indicated in entonic or phlogistic diseases, and this article is contra-indicated in atonic ones. Even the act of vomiting with this article fails of proving decidedly Adenagic, even while it lasts. As to the mischief that this article has done both in Nauseating and Non-emetic doses, and in Emetic ones also, I think there is no room for doubt or question; and it is high time that medical practice in regard to this point should be amended. But how shall this be brought about? I have occasionally seen very violent and even alarming effects from very small quantities of this agent, in cases to which it was exceedingly inappropriate; but such instances fail of discouraging its use in any degree, by those not guided by the principles just recognized, because all cases that are apparently of the same character, are not always affected in the same manner by it. For my part however, I can not perceive the strength of the argument against the Tartrate of Antimonia and Potassa derived from the circumstance that it will produce effects upon the heart of a Frog more or less dissected, which Opium will not produce.

But notwithstanding all that I have now said, I deem it possible, by suitable conjunction of other articles, and by peculiar skill and dexterity of management, to make Tartrate of Antimonia and Potassa answer all the most important purposes of an Emetic, unless in Croup and in malignant diseases. But very few properly understand how to do this; and when it is understood, it is some what like the American Indians' throwing their Tomahawks at General Putnam's head, to see how near they could come to it without hitting it. I once knew a physician who was accustomed to say that he did not desire any better, or indeed any other Emetic for any case than Tartrate of Antimonia and Potassa; and I believe that he never used any other, except occasionally a little Cephaëlis. He certainly managed the former admirably. When he employed it in a case attended with considerable atony or exhaustion, he preceded, accompanied and succeeded it with hot Brandy and Water, or Brandy diluted with hot Infusion of Capsicum, and thus he mainly avoided one set of its undesirable effects. When the subject to be vomited was exquisitely susceptible and irritable, he conjoined more or less Papaver with it. He did not however use Emetics very often,

and never in malignant diseases. Thus this gentleman selected the very worst Emetic in the whole *materia medica* for his own sole use, and managed it so that it answered his purposes quite well; but I do not think it advisable to follow his example.

Zincæ Protosulphas, *Protosulphate of Zinc* or Vitriolum album, *White Vitrol* possesses the following different and distinct powers, viz. those of an Emetic, Nausiatic, Sub-cathartic, Styptic, Neuragic; and it is likewise somewhat Exhausting, though not sufficiently so to be in any degree Antiphlogistic. I think that the character of the Protosulphate of Zinc as an Emetic, is as much misstated in the books, as that of the Diprotosulphate of Mercury. During the whole of my practice before my residence in Springfield, I never saw it operate as the books describe, nor did I ever meet with a physician who had seen it operate in this manner. At one period of my practice, I employed it quite frequently, and I never yet knew it operate speedily and much less quickly. I found on inquiry that the same was the fact in the practice of all my professional friends and neighbors. Under my own observation it never produced fair and full vomiting alone and unaided by Cephælis, though it produced a great deal of straining and retching, and though I have administered it in all doses between a scruple and two drachms. I have received testimony to the same effect from nearly all my medical friends. At last, I ceased intirely from its use alone and unconjoined with any thing else. Mingled with half its weight of Cephælis and with the addition of a little Papaver I could make it vomit with moderate speed and with sufficient kindness. I never met with any physician who continued its use through any considerable period of his professional career, who did not soon find it expedient—in fact necessary—to conjoin a considerable quantity of Cephælis with it.

As an Emetic then, I consider this article as slow in its operation, i. e. with nothing else conjoined; and as affecting the action of the diaphragm, thoracic and abdominal muscles more in comparison with the more common Emetics, than it increases the upward peristaltic action of the stomach and œsophagus; and consequently that it can not by any means be considered as a kind Emetic. The amount of Nausea which it produces is not extreme, but it is quite persistent, preceding, accompanying and suc-

minutes. This patient did not die till between ten and eleven o'clock A. M. The length of time that she survived after the physicians reached her bed-side was unequivocally due to efforts at producing factitious respiration ; and I have not the least doubt that her life might have been saved if we had had any suitable apparatus for keeping-up factitious respiration till the effects of the Narcotic could have passed by.

Now I have happened to see several cases like this in all essential particulars, so that I can form a somewhat better judgment in regard to them, than if I had seen only a single case. Could vomiting have been produced in this case, at the time I was first called ? I think not with Tartrate of Antimony and Potassa ; but I believe it might have been, with the Protosulphate of Copper and the Distilled Water of *Ranunculus Flammula* conjoined. I judge so from the observation of the effects of these articles in other cases where patients have seemed to be quite as powerfully affected, though by much less Papaver. The esophageal and gastric par vagum seems to retain its functions the longest under the influence of those Narcotics which destroy life by suspending the functions of the nerves of expression. The great Sedative effects of Papaver, with the addition of the powerfully Exhausting and the strong Neuragic effects of the Salt of Antimony, which, from the relative slowness of the Emetic operation of the latter article, would have ample time for production, I should think, would be quite likely to prevent vomiting. At all events, I have commonly (and as near as I can remember, invariably) seen Antimony fail of vomiting, in a subject powerfully under the effects of Papaver, whatever may have been the reason. I do not suppose however, that it will fail in absolutely every case. But Protosulphate of Copper and the Distilled Water of *Ranunculus Flammula* not being at all Exhausting, both in all probability being more or less Oresthetic, the latter not being at all Neuragic, and both being too speedy in their Emetic operation for the production of such an effect, even though one of them possesses the power, will almost always vomit, either in larger or smaller doses, in the most of such cases. At all events, if my reasons are not the true ones, the facts are as I state.

But will vomiting render any service in extreme and dangerous Ultimate-Narcosis from Papaver for example ? This will

continuously and protractedly, it certainly diminishes the tone of the organs of primary digestion, and sooner or later, of other parts, and indeed the whole of the system. At the time of my professional pupillage the notion of its Tonic power was more prevalent than ever, either before or since. It was then mainly used as a mere Tonic in chronic diseases, but scarcely ever without being conjoined with vegetable bitters which were true and unequivocal Tonics. Under such circumstances, there is no wonder that it passed with many as a genuine Tonic. My error however was first corrected by observing the sequelar effects of its use as an Emetic. After this, I employed it unconjoined with any thing and intirely alone, in Non-Nausiatic and Non-Emetic doses which soon settled all question with me as to its Tonic power, and settled it too in the negative. The fact that by judicious adjuvantia and corrigentia, together with skilful and dexterous management, Protosulphate of Zinc may be made to subserve the purposes of an Emetic sufficiently well in most cases, is not more an argument in its favor as a common Emetic, than the same argument would be in favor of Tartrate of Antimonia and Potassa for the same purpose; or than it would be in favor of employing in all cases only one single article from each medicinal class.

No Emetic is more misrepresented in medical books than Hydrargyræ Diprotosulphas, *Disprotosulphate of Mercury, Turpeth-Mineral* or *Mineral-Turpeth*. As an Emetic, it is slow, effectual and kind in its operation, usually increasing upward peristaltic action of the stomach and œsophagus more than it acts upon the diaphragm, thoracic and abdominal muscles, and consequently it is sufficiently kind in its vomitive effects. It has but a moderate degree of Nausiatic power, though before its effects are finished, it generally but not always proves Cathartic. It is an effectual Adenagic independent of its Emetic and Cathartic operation, and if the patient takes enough of it, and continues its use for a sufficient length of time, it also proves Neuragic. It is by no means liable to Salivate, though if there has recently been a Salivation, it will renew it. It may likewise produce this effect in some peculiar habits or under some peculiar diatheses. I make this statement however from testimony intirely, never myself having seen Salivation occasioned by it. It is ill adapted to the removal of poisonous substances from the stomach, on account of

charges. Still she would not be quiet without a Cathartic almost every day. If her physician would not consent to this, she would take one without his consent. She did not appear to have the least belief in the maxim "*ex nihilo nihil fit.*" Indeed, she often greatly injured herself in this way. One day after the morning visit of her physician, she determined to take a Cathartic contrary to advice. After a few remonstrances, her husband consented to comply with her wishes, and he gave her, as he supposed, a teaspoonful of the common Tincture of Aloë and Myrrh, made without the Crocus, which is directed in all the Pharmacopæiæ. For her this was a full Cathartic dose. By mistake the common Tincture of Opium was given in its stead. By some means or other, neither the patient, nor her nurse detected the error till her husband came home about two o'clock P. M. She was probably preternaturally wakeful for a while, and then fell into a deep Coma, which was so little attended-to, as to be supposed to be a natural sleep. As she was supposed to sleep so comfortably, the nurse made no attempt to administer any medicine. When the husband got home he appreciated her condition at once, and dispatched a messenger for such physicians as were likely to be obtained with the greatest speed. Though not where I resided, I was accidentally in the place and saw the patient in the morning. As it was known exactly where to send for me, I got to the bedside of the patient the soonest; but the attendant physician and an other medical gentleman, whom he brought with him, arrived in a very few minutes. At this time (it might have been about three o'clock P. M., I think not much later) the case appeared to us all to be utterly hopeless. We examined the teaspoon in which the dose was measured, and we judged that if it was heaped to the utmost it could not contain more than a fluidrachm and a half; and in all probability but little more than a fluidrachm was taken, judging by the statement of the husband. As the family and friends, in their ignorance of the subject, were not only extremely solicitous, but even very importunate that this patient should be vomited; and as this could make but little difference in the time she would survive, and in all likelihood would not be productive of any particular distress under existing circumstances, we concluded to comply with their very strong desire; though we had no expectation of any benefit from the process. I do not

now certainly recollect what Emetic was employed, but from a knowledge of the articles commonly used for such a purpose by the physicians in attendance, I doubt not that it was a mixture of Protosulphate of Copper and Cephaëlis. The reason why vomiting was preferred to the repeated injection and pouring-off of warm water from the stomach, was partly the wishes of the bystanders, and partly the very faint hope that the act of vomiting might contribute somewhat to obviate the torpor and insusceptibility or prostration, and thereby to arouse the patient. I do not now recollect how the Emetic was got into the stomach, but I think it was injected through a tube passed down the œsophagus; but sufficient and kind vomiting was produced, and that without any especial difficulty. This was accompanied with all the other means that seemed to afford the least prospect of any benefit. No sort of service was rendered. In fact, it seemed as if the Coma was rendered more intense, and as if the final event was hastened by what was done. How could it possibly be otherwise, as the stomach was probably empty when the Tincture of Opium was swallowed, the dose so small that it doubtless had entirely disappeared from the stomach before the mistake in the medicine was discovered; and finally, its extreme effects were produced before the case was seen by any physician. This was the smallest quantity of Papaver that I ever knew destroy the life of an adult.

Before the Ultimate-Narcosis has acquired a fatal degree of intensity, and when there is good reason to suspect that a greater or less amount of the Papaver still remains in the stomach, then we may expect benefit from an appropriate Emetic; and it will benefit by its arousing, as well as its evacuant operation, provided it is well chosen, i. e. suitably Oresthetic and speedy, and not materially Neuragic or Exhausting.

2. For the obviation of torpor or insusceptibility, or in one word, prostration not attended with any considerable degree of Exhaustion. The Emetics appropriate for this purpose are the Non-Exhausting; the not powerfully Nausiatic; the not actively Neuragic; but the Oresthetic and the quick ones. If materially Exhausting ones are selected, they may occasion more injury by their Exhausting operation than they produce benefit by accomplishing the purpose for which they are employed; or indeed, if they are materially Exhausting, this operation may transcend and

supersede the effect for which they are given. If the Emetic selected for this purpose is powerfully Nausiatic, this operation very often transcends and supersedes all arousing operation from it. If actively Neuragic ones are selected, their Neuragic operation very often counteracts, and sometimes transcends and wholly supersedes all arousing effects.

But I do not think that Emetics, even when well chosen, are the best agents for the obviation of torpor, insusceptibility or prostration. When they do accomplish this purpose, they do it more speedily than any other class of agents; but they are no more effectual than judiciously selected Oresthetics, while they are more liable to fail of producing the desired effects, and still more liable to produce undesired ones. It should be distinctly understood that the rejection of any of the contents of the stomach is by no means necessary to the most perfect arousing effect of an Emetic. The mere act of straining or retching, without any upward peristaltic action of the stomach and œsophagus, seems in general to accomplish the desired purpose as well, indeed better usually, than full vomiting. To this, however, there may be a few exceptions, as perhaps in some cases where there is no other morbid condition of any sort, except the torpor, insusceptibility or prostration merely. Where other pathological conditions exist beside the torpor, insusceptibility or prostration, the Emetic, even when it accomplishes the purpose for which it is administered, some times injures by means of the evacuation which it produces. Many physicians use Emetics for this purpose, even when there is considerable atony or exhaustion of the sanguiferous system, and probably of all the subordinate parts that are dependent upon the nerve of chemical action, nutrition, etc. This practice is sometimes successful, but is always more or less hazardous and therefore is seldom very judicious. I recollect a case of that extremely malignant disease called by some physicians in Connecticut Typhus Syncopalis, that will illustrate what I have here inculcated. The patient sat down at the breakfast table, for aught she knew, in perfect health; and, so far as her family observed, eat as usual. When however the rest of the family were ready to rise and depart, this individual was found to be unable to do so. A physician was summoned from the immediate neighborhood, who found the patient cold, pulseless, and with so much

Coma as to be unable to understand and answer questions, and yet retaining the ability to swallow, provided the back part and side of the tongue were pressed rather hard with the handle of a tablespoon. The physician well knowing the character of the disease and what it required, began immediately to administer Brandy, and this only a little diluted with a hot Infusion of Capsicum. In this way, and within a short time, half a pint of the Brandy was swallowed and perhaps two fluid-ounces of a strong and hot Infusion of Capsicum, but with no apparent effect either in kind or degree. After a short time, ten grains of Protosulphate of Copper, with a little Cephaëlis, were administered. In about a quarter of an hour, the patient retched several times with considerable energy, but without rejecting a particle of anything from the stomach, when immediately the Brandy and the Capsicum began to take effect, warmth and pulsation gradually returned, and the Coma passed-off. This was notoriously a disease in which evacuations of all sorts, though less from the stomach upwards, than from any other emunctory, were palpably injurious. Nothing was more common than for a patient, at the very outset of the disease, to pass into the very article of death under discharges that were intended to be trifling, being produced in very short times, by very small doses of some of the mildest articles of their classes. I have known a very few grains of Cephaëlis to operate within a very short time quite freely both as an Emetic and a Cathartic, the patient passing into the article of death under the very first discharge, whether from the stomach or intestines, and dieing in a very few hours afterwards, i. e. about three.

But there are cases enough that will tolerate vomiting for this purpose with a judiciously selected article; and yet all my observations and experience lead me very greatly to prefer non-evacuant Oresthetics as more certainly efficacious and far less inconvenient for the purpose now under consideration. The longer I practice medicine, the less favorably I think of vomiting for the purpose of obviating torpor, insusceptibility or prostration; and so far as my observations extend, this process is in less favor for this purpose, with the profession at large, than when I began my professional career, and is steadily becoming still less so.

3. For the shock or strong impression which it makes upon the

stomach and upon the system at large. In the forming stage of a disease, and some times even after it is fairly formed but recent, and while the actions are feeble (as is generally well known) a shock or sudden strong impression upon the system will often arrest its further progress, i. e. break it up intirely, or in other and more professional terms, produce a resolution of it. It is believed to be upon this principle that tricks played-off upon a patient, or a sudden fright, will suspend for the time being, and often absolutely cure a moderate Intermittent of only brief duration. Some physicians always, or almost always, begin the treatment of Intermittent with an Emetic. The reason assigned for this is, *first*, the supposed utility of the shock or strong impression for arresting the paroxysms, and, *second*, the supposed benefit to this disease from what is termed clearing-out the stomach. As to the first, it appears to me to be of no importance. Its effect is perceptible only in slight cases, and even in these is of no permanence. In intense cases, no other effect is produced than that it renders a greater quantity of a more appropriate medicine necessary for a radical cure. As to what is termed clearing-out the stomach, I have long been convinced that it is of no utility, but that it often, indeed generally, renders a greater quantity of a more appropriate remedy necessary for a radical cure. I have often tried both Emetics and Cathartics as commencing measures in the treatment of Intermittent, and have long been satisfied that they are injurious rather than beneficial, and some times very prominently so. It is now long since I intirely discarded the use of both, in my practice in this disease. It is upon this principle, doubtless, that certain diseases of atony or exhaustion, such as Typhus nervosus, Pneumonitis Typhodes-nosta, etc. are some times arrested, and perfectly resolved, in their earliest or forming stage, by a sudden and rapid abstraction of two pints or more of blood. These are not diseases in which this process in any degree, except for its shock or strong impression, can ever be truly or properly indicated. They are in all stages attended with more or less atony, i. e. exhaustion of the sanguiferous system, and doubtless of all other parts dependent upon the nerve of chymical action, nutrition, etc. and by the very laws of these diseases, such atony is always increased with the progress of the maladies. Now the sole operation and effect of Depletion of Blood is to produce ex-

haustion in all these parts, with the exception only of the shock which it gives, and the strong impression which it makes, when a large amount of blood is abstracted quickly. Now a disease essentially attended with a greater or less degree of Exhaustion in those subordinate parts which are dependent upon the nerve of chymical action, etc. can not possibly be resolved merely by increasing this Exhaustion still further. The view here taken explains why this process is so dangerous in all intense cases of atonic acute diseases after the first stage, or at least after it has made any considerable progress, and why it is so certainly fatal, even in the commencing stages of highly malignant cases of these same maladies, and very many others, which are closely analogous. A measure which can be tolerated only in the inceptive stage of a disease, but is injurious, and even dangerous in every other, can never be very judicious at any time. In a truly entonic or phlogistic disease, there is no need of any such caution, for Depletion of Blood may be employed with the most decided advantage at any and all times before a perfect crisis.

As long ago as between 1800 and 1806, it was very common practice to begin the treatment of every case of Typhus nervosus with an Emetic, and this too if possible, in the stage of predisposition, and before the positive beginning of the actual disease. But few however called a physician sufficiently early for this. I have often inquired of different gentlemen as to the object of thus commencing the treatment of this species of Typhus with an Emetic. In general it was said to be established practice approved by long experience. Some however justified it by the hope that it might possibly produce a resolution of the disease, but admitted that experience afforded but a slender foundation for such hope. I soon had opportunity to observe that all who did in fact call a physician and take an Emetic during what is called the predisposition, invariably went through a course of the disease; so that I very much wondered how this process ever acquired any degree of reputation for producing a resolution. On the other hand, I observed that of those who had the symptoms of a predisposition even in the most intense form, but who did not call a physician, and did not take an Emetic, very many escaped a course of the disease. After I had observed this, but before I had ventured to speak to any practitioner about it, one gentleman said

between pain in the glans penis and Stone in the urinary bladder; irritation in the nostrils and worms in the upper and smaller intestines; pain in the shoulder and a certain disease of the liver; etc. I would have everything in medicine pass for what it is really and truly, and for nothing else.

The only other secretion into this cavity is that of mucus. Normally, i. e. in perfect health, there is only enough of this to lubricate the lining membrane of the canal; but in certain diseases facts are quite different. Though apparently of no importance to the function of primary digestion, never the less this secretion seems to attract more attention under disease than all the rest, because it assumes so many forms and takes so many colors, though I believe that many of them are not recognized as productions of the mucous follicles. I have found many physicians disposed to attach more importance to the variations in color and consistence of these secretions, whether produced by disease, by the use of Adenagics, or by Emetics or Cathartics, than to any other circumstance. I have known them make it the principal object of their attention, and deduce, not only their indications of treatment, but make their prognosis from it. When it happened to have some unwonted or unusual color, I have known the greatest apprehensions from it.

Sometimes a mucus very little changed from that of health, but very greatly increased in quantity, is poured forth. This constitutes, as I have always supposed, an idiopathic species of the nosological genus *Blennorrhœa*, viz., *B. intestinalis*, when it is not preceded and accompanied by any other disease. In all cases of this morbid condition of the secretion from the mucous follicles, at least all that I have ever seen, there has been a slightly preternatural increase of the peristaltic action of the intestines, perhaps just enough to bring the case under the generic denomination of *Diarrhœa*. If it is such it is only a very moderate one, and with decided peculiarities. This is the sort of cases in which it was formerly deemed of so much importance to purge off viscid mucus. I have always supposed this to be Good's *Diarrhœa mucosa*.

Sometimes an intimate mixture of mucus and pus is poured forth. This is never idiopathic but always symptomatic. I have seen it as a sequel of neglected or ill-treated *Enteritis Typhodes-Dysenterica* or *Dysentery*; of *Enteritis Hectica-Strumosa* or *Chronic*

either in the forming, or one of the early stages, will much more certainly produce a direct and speedy resolution, as for example, the very common Phlogoticum, Pneumonitis Typhodes-notha. I have quite often known the most decided cases of this disease immediately arrested and in fact suspended by Emetics. Indeed this was the most common way in which one of my professional friends was accustomed to treat this disease; and I must say that he always managed his Emetics with singular skill and dexterity, and very rarely failed of accomplishing his purpose. I have known a number of gentlemen who adopted this course, and were commonly more or less successful, but none of them equalled my friend first mentioned. I have myself tried this plan, and had a good measure of success but still inferior to my friend. Undoubtedly some individuals succeed better with a particular method than others do; and I have been better satisfied with a different plan, or at least have accomplished more with it. I suppose there must have been some defect in my adaptation of an Emetic to the circumstances of different cases, and quite possibly also of my subsequent management of it.

Thus far I have supposed that the resolution of Pneumonitis Typhodes-notha in its early stages by Emetics, is occasioned by the shock or strong impression which they may be made to give, since I very well know that Emetics which possess no independent Adenagic power may often be made to break-up this disease in its earliest stages; and yet, as we may have the benefit of the operation of two powers just as well as of one merely, I always recommend an Adenagic Emetic in such cases, in preference to any other; and hence, in my subsequent specifications of the Emetics that we should select for the resolution of any and all the Phlogotica, I shall always mention one of this character. For this disease then the Emetic should always be an Adenagic one; it should be thorough but not harsh in its operation; it should be destitute of all Exhausting power; and the less Nausiatic and Neuragic it may be, the better it will suit this disease. I once knew an intense Rheumatism, under which the patient was completely helpless, being wholly unable to stand upright and much less to walk a step, suddenly and perfectly removed by an accident that crushed one of his thumbs, actually comminuting the bones, so that it became necessary to amputate it at its metacarpal

Dysentery, and that which is not the most rapid in its access, the earliest morbid secretion from the mucous follicles is very much like milk. It has often been mistaken for chyle. This gradually becomes of a Pink-color, and finally passes into true and proper sanies. In some very peculiar cases of Enteritis Typhodes-Dysenterica vel notha or Dysentery, (for the Phlogosis of the lining membrane of the upper and smaller intestines in this disease is specifically the same as that of the bronchial membrane in Pneumonitis Typhodes notha) I have known the secretion of the color of the juice of Elder-Berries, or like the darkest Port-Wine.

In all cases of Diarrhœa, but more especially in Diarrhœa chronica, there is always an abundant secretion of air into the upper and smaller intestines. This is not only the first morbid condition of Diarrhœa, but it is also the last, by which I mean the last to yield intirely even to the very best treatment. I call this air a secretion, without the least hesitation, since it can be nothing else. It can not possibly be produced by fermentation as was once supposed by some, since the other discharges accompanying those of air abundantly disprove this hypothesis, as does the principal circumstance which accompanies the presence of the greatest amount of it, viz. the emptiness of the upper and smaller intestines. I do not think that fermentation is ever possible within the organs of primary digestion. This secretion of air is by no means peculiar to Diarrhœa, but takes place in various functional diseases of the organs of primary digestion. There is one disease, doubtless, that which Good calls Limosis Flatus, which is characterized by paroxysms of an almost immeasurable secretion of air, which is not only evacuated downward but eructated. The more empty the stomach and upper and smaller intestines, the more abundant is this secretion; and I believe the paroxysms always begin in connexion with unwonted abstinence. Indeed, a moderate preternatural secretion of air attends nearly all of the mere functional diseases of these organs.

Very many persons both non-medical and physicians suppose that all uneasy sensations and pains in the whole alimentary canal are occasioned by "wind," as the popular term is; and that this supposed "wind" is always produced by the fermentation of something taken into the stomach, either as food or drink. As appears to me, no hypothesis can have less foundation than the last. But

distressing, but kind and and thorough. When small quantities of these articles vomit, and that in a short time, no serious case is likely to be cured by them. As an Emetic at the outset of this disease, and especially when it is the sole one, the Infusion is the best pharmaceutic form for Sanguinaria. The Tincture however will answer exceedingly well, when it is to accompany the Diprotosulphate of Mercury. According to my observations, the powder of the root is worthless as an Emetic in Croup. Its operation is too inefficient, too much like that of mere *Cephaëlis*. In this form I never knew it produce any Adenagic effect. As a mere Adenagic, and in doses and quantities short of the vomiting point, the Tincture is as good as any pharmaceutic form that I have mentioned.

About a hundred years ago (more or less) there were several old physicians in Connecticut, who were very remarkable for their success in the treatment of true Croup. All testimony was unanimous in their favor; and it was agreed that they cured nearly all their cases, while others succeeded in curing only a very few, and some times none at all. While I was young as a physician, and when there was a considerable number of medical gentlemen living, who had witnessed their practice, I undertook to ascertain what it actually was; and I have no reason to doubt that I succeeded perfectly. It appeared to be, first, vomiting thoroughly with Sanguinaria at the outset of the disease, and subsequently this same article in as large doses and quantities as the stomach would tolerate without vomiting; the effects which it produced when given in the latter way being modified by a comparatively free use of *Papaver*, given in uniform doses at short and regular intervals. I can not doubt the testimony as to the success of this treatment, because I have repeatedly known full as large a proportion of cases cured by several different individuals, who relied mainly upon the same remedies, but still employed several others in connexion with them, and some times as substitutes for them. As the practice in question was agreed to be so much more successful than any other in use, at that period of time, I endeavored to ascertain why it was not imitated by other physicians. The reason assigned was that other physicians did not consider themselves allowed to deviate from the received authorities of the times. As the disease was a Phlogosis, they thought it must be

right to treat it with Depletion of Blood, Antiphlogistic Saline Cathartics, Urginea Scilla and Antimonials as Expectorants, etc. This position was thought to be right as a matter of principle, and if it failed, it was considered due to some accidental circumstances which had escaped their notice, etc.

Arthritis Rheumatismus *var.* acutus, may very often be resolved at its outset, or at any time within about ten days, provided there is no tampering with injudicious measures before hand, by well selected and sufficiently active Emetics. The more exquisitely acute the disease may be, and the earlier after it is fairly begun that the Emetics are employed, the more speedy and certain will be the resolution by vomiting. I have known it produced after the disease had been fully formed for three days. The same friend so much in the habit of using Emetics in Pneumonitis Typhodes-notha was also somewhat in the habit of using them in this disease also; and as far as I had knowledge of his practice, with success. However I never saw this disease treated in this way sufficiently often to be able to judge conclusively in regard to its comparative merits. If a single Emetic fails of producing the desired effect, a second will sometimes be successful; but beyond this a repetition is believed to be seldom expedient. A Non-Exhausting but Adenagic Emetic should be selected; and if a very large dose is necessary to ensure a particularly active operation, Papaver may be conjoined for the purpose of rendering its effects kind.

Emetics are very frequently employed in Icterus Aurigo, or Common Jaundice; but I greatly doubt the utility and propriety of the practice. I have often prescribed them in this disease, but I never witnessed any decided and unequivocal benefit from them, either under my own management or that of my friends and acquaintance. I doubt not however that the act of vomiting exerts a considerable influence upon the whole secernent and absorbent or glandular system, of which Icterus is undoubtedly a disease, and in which, as a general whole, it appears to me to have its exclusive seat. The effect of vomiting upon the secernent and absorbent or glandular system is sufficiently obvious by its resolvent effects, i. e. its power of resolving topical Phlogosis, which is well known to the medical profession. Indeed, as I have just said, I have repeatedly seen exquisite and intense Arthritis Rheuma-

tismus *var. acutus* perfectly resolved and wholly removed by Emetics, which sufficiently proves their power over the secernent and absorbent or glandular system. On the other hand I have repeatedly seen perfect though transient Icterus produced by the act of vomiting, when there were no previous indications of any predisposition to this disease. I have seen it oftenest produced by Tartrate of Antimonia and Potassa, I suppose because this is the oftenest used article for the purpose of vomiting. I have also seen Jaundice produced by vomiting occasioned by eating flesh that had been kept too long; by vomiting produced by eating certain glandular parts of animals, as the kidneys and liver for example, which always disturb some stomachs and are more liable to disturb all, than other parts; by eating certain productions of the sea-shore as Mussels, Escalops, Long-Clams, Lobsters, etc. Where I have known such vomiting produce Icterus the vomiting has always been severe and protracted. Such Icterus commonly lasts a month or two. I state this as the result of repeated observation. I do not know why it is so. It is certainly not what I should expect *a priori*. After observing the facts myself I made inquiries and found that other physicians had likewise observed them. I can not refrain from adding here that I have no recollection of ever witnessing any appreciable benefit from vomiting in Icterus, and it is now some years since I ceased employing this process in that disease.

I have now specified cases of the application of Emetics to their several purposes sufficient to illustrate my meaning, and here I leave the subject.

PROEM TO THE CLASS CATHARTICA.

THE term Cathartic is an ancient Greek term, with the omission of its articular termination. It is derived from a Greek verb signifying *to purge*. Catharsis is likewise an ancient Greek term denoting the effect of a Cathartic.

Definition. Cathartics are articles which, when first taken into the stomach, directly and immediately produce, *first*, a secretion of more or less air into the upper and smaller intestines; *second*, a secretion of more or less serum or water into the same cavity, both of these secretions being from the mucous follicles; *third*, sometimes, but not always, an increased secretion from the pancreas in all probability, and from the liver certainly; *fourth*, preternaturally increased downward peristaltic action of the whole intestinal canal, beginning in the upper and smaller intestines and extending to the lower or larger; by means of which there are preternaturally frequent, as well as preternaturally liquid alvine discharges.

The class Cathartica has been recognized from the earliest records of medicine. My definition will perhaps be admitted to be more suggestive of the physiology of the process than the ordinary definitions of authors. It is worthy of especial attention, that if Catharsis consists in a preternatural and specifically changed (I think I may say vitiated) secretory activity of the mucous follicles of the upper and smaller intestines, and in preternatural activity of the muscles upon which the peristaltic action of the whole tract of the intestines depends, Catharsis as such, cannot certainly be either indicated or required, except where one or the other or both these operations is capable of being useful.

The natural division of the alimentary canal is into, 1st, the mouth; 2d, the œsophagus; 3d, the stomach; 4th, the upper and smaller intestines; 5th, the lower and larger intestines. These several parts differ not only in structure but also in function.

The division of the upper and smaller intestines into 1st, Duodenum; 2d, Jejunum; and 3d, Ileum is not a natural division, since

these parts differ neither in structure nor function ; and the same may be said of the division of the lower and larger intestines into, 1st, Cæcum ; 2d, Colon ; 3d, Rectum.

From the upper and smaller intestines arise a set of absorbent vessels commonly called lacteal absorbents, or lacteals, simply. A greater number of these originate from that portion called *intestinum jejunum*, than from either the *intestinum duodenum* or the *intestinum ileum*. The lacteal absorbents take their rise from and open into these intestines, and passing through the mesenteric glands they terminate and empty into the *receptaculum chyli*. It seems to be their function or office to take-up and carry into the blood vessels the nutritious part (not the whole) of the chyle. If they took up the whole there would be no *fæces* remaining. Doubtless, like all other absorbents, in the very act of absorption, they decompose and recompose into a new form what they take-up, and what they do not take-up, is mere *fæces*. No power exterior to the living upper intestinal canal seems capable of making this separation. What they take-up would seem also to undergo some useful change in its passage through the mesenteric glands, since, if these are diseased, the system fails of being properly nourished. There is no reason to think that anything can be taken-up by the lacteal absorbents which has not undergone both gastric and intestinal digestion, i. e. been first duly converted into chyme in the stomach, and second, into chyle in the upper and smaller intestines.

At the termination of the upper and smaller intestines, which, as near as I recollect, constitute about two thirds of the alvine canal, begin the lower and larger intestines. These are very different in their size and appearance ; very evidently constitute quite a distinct portion ; and are separated from the upper and smaller intestines by a comparatively stout valvular apparatus. The lower and larger intestines are commonly divided into cæcum, colon and rectum. So far as the two last mentioned are concerned, there appears to me to be no difference and no foundation for distinction. They are a mere reservoir for the refuse of the food, in order that it may be evacuated only periodically, instead of continuously. They stand in the same relation to the rest of the alimentary canal, in which the urinary bladder stands to the kidneys.

The lower and larger intestines have no secretions analogous to

times, mere Stimulants. Let us suppose that a subject should be purged to death—a thing quite possible, I doubt not—though the possibility of it does not appear to be suspected by many; and let us suppose this accomplished by Sulphate of Soda or Glauber's Salt, such subject would of course have been Stimulated to death.

It seems to be taken for granted by physiologists that some specific Stimulus is necessary to keep-up the natural peristaltic action of the alimentary canal; and it is commonly said that the agents by which it is accomplished in health, are the gastric liquor, the pancreatic liquor, the bile, the gall, and the ordinary mucus from the lining membrane. I can see no reason whatever to conclude that either of these secretions have any connexion with this matter. I never met with the least evidence of it; and certainly all probability is against it. All these fluids have other functions to perform. It is not to be supposed that gastric or pancreatic liquor, bile or gall, and much less mucus, have any proper irritant power, or produce any specific irritation of the alimentary canal in health or affect the susceptibility of the muscular fibres of the intestines in any manner or degree. Bile and Gall have been supposed by some to be natural Cathartics, and to be secreted for the sole purpose of keeping-up the peristaltic action; but so far as I know, nobody has ever yet shown that either of these secretions possess any such power. I have known practitioners who habitually employed Ox-Gall for Coprostasis, particularly in Dyspepsia; but I never happened to witness any effect from it.

I have indeed heard it suggested that the mechanical irritation of distension, as by the fæces, is the true power by which the peristaltic action of the intestines is kept-up. If there were ordinarily any such irritation throughout the whole tract, it would constitute a more plausible agency; but nothing of the kind ever exists in the upper and smaller intestines, which are much the larger portion; and in fact, it very rarely exists in the lower and larger; while in health the peristaltic action is uniform and continuous in both portions. Indeed when there is the very least mechanical irritation of distension, as in Diarrhœa there is the greatest amount of peristaltic action.

By what irritation or Stimulation is the action of the sanguiferous system kept-up? I have indeed heard it supposed that what has been called the Stimulus of the blood is the immediate cause

food it may happen to be formed ; and its proximate principles are always different from those of the food. Nothing can be less like a true and proper solution than a change like this.

But by what power or powers is gastric digestion performed ? The gastric liquor is undoubtedly an important agent in gastric digestion ; but according to my belief, it is not the principal one. The gastric liquor out of the stomach will do nothing toward digestion. Alone it will not decompose a single proximate principle of any article of food, nor will it recompose a single principle of normal chyme. The influence of the stomach as an organ endowed with vitality, and receiving also the nerve of chymical action, nutrition, etc. is quite as necessary for gastric digestion, as the presence of the gastric liquor. Precisely what part each of these agencies or influences performs, is not known, and in all probability never will be ; but they are all absolutely necessary, and they must act in conjunction. As soon as the food is fairly converted into perfect chyme, it passes through the pylorus, into the upper and smaller intestines. But if by any means the food does not happen to be converted into chyme, but remains indigested, it will often be retained in the stomach for an unusual period, and at last will often be rejected by vomiting. If the patient happens to be affected with *Diarrhœa* however, indigested food will sometimes pass readily and rapidly not only through the stomach, but also through the whole of the intestines.

The upper and smaller intestines are as pure organs of primary digestion as the stomach itself. Indeed the most delicate and refined part of primary digestion is performed in them, viz. the conversion of chyme into chyle. This is done principally in their upper part called duodenum ; from the second part called jejunum, the principal part of lacteal absorption takes place ; and in the lower part called ileum, a small quantity of thin liquid fecal matter begins to appear, which is immediately discharged into the lower and larger intestines, its own proper reservoir. Digestion in the upper and smaller intestines also involves a true chymical decomposition of the chyme, and a recomposition of it into a new form. The proximate principles of chyle, which are the result of intestinal digestion, differ as much from those of chyme, as those of chyme differ from those of the food. Intestinal digestion is no more a mere solution of the chyme than gastric

keep-up their action. They are inherently and continuously motive, requiring no external power to keep them in action, and needing no rest. If any one says that he can not understand this, I answer neither can I; but this does not render it any the less a fact; and it is by no means the only fact in physiology that I do not understand. It is first a question whether it is a fact or not, and if it is, that is sufficient. I do not think that there is the least ground for doubting what I affirm. Nobody can investigate this subject carefully and thoroughly, and arise from such investigation with any doubts as to the real facts.

It has been maintained that the peristaltic action of the alimentary canal is occasioned by the "Stimulus" of its contents; and that the peristaltic action of the lower and larger intestines is occasioned by the "Stimulus" of distension from their contents. I will just remark that by "Stimulus" is here doubtless intended what may more appropriately be denominated irritation. No body can reasonably suppose that the ordinary contents of the alimentary canal ever increase vital energy and strength of action in any subordinate part of the system—an effect essential to the operation of a true Stimulant, as I have already inculcated. This general statement has always left me in the dark as to whether it is the quality or the quantity of the contents of the canal that constitutes the supposed "Stimulus." If it is the quality, the canal must be capable of being excited into peristaltic action by quite a diversity of "Stimuli." In health, the masticated food, the gastric liquor and the chyme must be the agents that produce peristaltic action in the stomach; the chyme, the pancreatic liquor, the bile, the gall and the chyle must be the agents that produce it in the duodenum; the chyle must be the agent that produces it in the jejunum; while a little liquid fæces must produce it in the ileum. In the lower and larger intestines it must be produced by solid fæces. This is certainly a great diversity of "Stimuli" or irritants for this single purpose. What "Stimulus" or irritation can those muscles be considered as having, which carry on respiration in profound sleep; and if these require none, why should the secernents and absorbents, the heart and blood-vessels, and the muscles which produce the peristaltic action, require any? For my own part I can not possibly believe that any "Stimulus" or irritation of the parts that act, is at all necessary for keeping up

seem as if they should have been poured into the intestines far lower, perhaps into the ileum, or possibly below the valve of the colon. I have heard the hypothesis that these secretions contribute to the separation of the nutritive from the excrementitious matter, and are themselves excrementitious. If we must have a hypothesis in place of a thoroughly proved fact, this appears to me to be as good as any one that has thus far been put forth. It may be recollected that this hypothesis has reference only to the offices which these secretions perform in relation to mere intestinal digestion. The field is considered as still left open for hypothesis in relation to the offices which these secretions perform in regard to any other functions, or in regard to the animal economy generally. Assuredly the upper and smaller intestines are as truly organs of primary digestion as the stomach; and if performing a more refined part of this process is any ground for such a view, they are even more eminently such.

These facts and circumstances show satisfactorily that the secretions of air and serum or water, which a Cathartic produces, take place only into the upper and smaller intestines. If all this is true, it will be sufficiently obvious that the principal part of the operation of all Cathartics must of necessity be upon the upper and smaller intestines; and that there can be no just foundation for the opinion that some Cathartics operate more especially upon the upper part of the intestinal canal; that some operate more especially upon the middle part; while others operate more especially upon the lower part. By all this, I would not be understood as questioning the utility of taking cognizance of all the peculiarities of the operation of all the individuals of every class of remedial agents; and of course, I would not be understood as questioning the utility of taking cognizance of the fact that certain Cathartics produce considerable sensation which is commonly referred to the upper part of the intestinal canal; that others produce considerable sensation commonly referred to the middle part; while others still produce considerable sensation commonly referred to the lower part. Perhaps some may be inclined to believe that there can be no material difference between producing considerable sensation which is referred to a particular part, and operating more especially upon such part. In my opinion, however, there is full as much difference between these two, as there is

ities widely separated. The solution of the Cathartic Salt was found in the abdominal cavity. I think that the facts in regard to the operation of Cathartics, of which we are in possession, render it certain that they produce their Cathartic effect exclusively by their impression and action upon the stomach and upper and smaller intestines; and in some cases, mainly by their impression upon the stomach.

A certain amount of peristaltic action in the alimentary canal is commonly supposed to be not only necessary to health, but even to life. It seems to be believed that an absolute and intire suspension of it must necessarily destroy life. Does this ever take place while the other functions immediately necessary to life continue? I know of no evidence in favor of an affirmative answer. If it does, in what manner would it destroy life? If, under such circumstances, life should not be destroyed in some other way more speedy, the subject might die for want of nutrition, i. e. of starvation. This would require a time between five and fourteen days. If however the subject should receive only a very little nourishment, it would protract life indefinitely. Though I have so long been familiar with the notion of the danger from a suspension of the peristaltic action of the alimentary canal, and with the apprehension that it may take place, yet I have never met with any case in which there was even a possibility of supposing such a condition as in actual existence. However, it may be considered as very certainly the fact that life may be sustained for a long time with an exceedingly moderate degree of peristaltic action in the alimentary canal, provided the activity of the sanguineous circulation, of secretion and excretion, and of voluntary muscular exertion and action are diminished in the same proportion. Under such circumstances life and the functions seem to be sustained much in the same manner as in hybernating brute animals.

In health how often should an intestinal discharge take place? It is commonly said that in health there should be an intestinal discharge in the course of every period of twenty four hours. This may perhaps be best as a general rule; but some of the most healthful persons that I have ever known very rarely had such a discharge oftener than every other day; and quite frequently they did not have one oftener than every three days. If such discharge was not hard, comparatively dry and voided with

greater or less difficulty, I never could perceive but that the person was as healthful under a discharge every other day, or even every third day, as under one every day. When the discharges are less frequent, they are commonly more full. But the quantity of the ingesta and the amount of ultimate assimilation ordinarily affect the frequency and the fulness of the alvine discharges; and ingestion and every grade of assimilation are affected by the amount of the labor, exercise or exertion of the subject. These considerations will render it obvious that there can be no fixed laws as to the frequency and amount of the alvine discharges, but that a considerable variation in both these respects is compatible with perfect health. I have very rarely known the general health suffer from pure and mere Coprosthesis; but nothing is more common (at the present time at least) than injurious effects from too much secretion into the alimentary canal, and too great an amount of the peristaltic action.

The main difficulty of treating in the best manner of the Cathartics consists in describing diagnostically, and in classifying their non-evacuant, i. e. altogether their most important effects. I doubt not that it will be found, and sooner or later recognized, that in the case of all evacuant medicines, the peculiar and specific impression made by the occult property or power, which is the foundation of the class, upon one or more of the subordinate parts of the nervous system, is the important—the medicinal operation, and not the discharge or evacuation produced. The nature and character of the discharges, and the qualities of the matters evacuated are things easily observed and appreciated. It is easy to determine whether it is fecal, serous or watery, mucous or sanious; or more generally still, whether it is merely soft or positively liquid. But what important indication or conclusion is to be deduced from either of these sorts of alvine discharges. So far as benefit from the treatment is concerned, I would as readily have any one of these as the other, with the exception only of the sanious, though I have occasionally seen this without any more harm or even inconvenience, than from the rest. This only indicates a considerably greater degree of irritation of the mucous membrane, and that, it is true, of a different quality, from any of the rest. In the diseases of the present day, it is of much more importance that the attention of the physician should be turned to the effects of Cathartics as to whether their general influence

cöincides with and aggravates the morbid action of a given disease, or counteracts and mitigates it, independent of their evacuant operation.

One of the most meritorious, and at the same time, one of the most eminent physicians ever produced by the State of Connecticut, once said in my hearing, and that, when I was quite young in the profession, that "if we could obtain all the effects of Cathartics upon the system at large, without the evacuations which they produce, he should consider the practice of medicine as much more nearly perfect than, at that time, he expected to live to see it." This sentiment was at once applauded by all the persons present except myself, who being a number of years younger than any other gentleman of the company, did not pretend to an opinion upon it; but reserved the subject for further consideration and reflexion. It was evident that the gentleman who made the remark had in view other operations and effects, beside the production of an increased secretion of air and of serum, and a great increase of the peristaltic activity of the intestines and of the alvine evacuations which must of course result. I began at once to consider what some of these operations and effects must necessarily be. I soon perceived that the subject was far more extensive and complex than appeared at first thought; much more so, in all probability, than even the gentleman himself appeared to imagine. With me, at any rate, it gave rise to a long train of thought. From that time to the present, I have attached far less importance to the evacuations produced by Cathartics than I was previously accustomed to do; though I do not at present subscribe to the exact truth of the gentleman's sentiment, any more than I supposed that he would, after an equal amount of consideration. But I never forgot the remark, and ever since when observing the operation and effects of Cathartics, I have been unable to avoid drawing conclusions in reference to it. I thought *first*, of the obviation of any torpor, insusceptibility or prostration, that might happen to exist; *second*, of the production of increased activity in the secernent and absorbent or glandular system; *third*, of the removal of pus or any other fluid effused into any cavity; *fourth*, of the shock or strong impression made upon the system at large, by the process; *fifth*, of the exhausting effect which in a greater or less degree always results; *sixth*, of the specific influence exerted upon one or more parts of the nervous system, by that occult

quality of the article, which constitutes the Cathartic power, etc. Which and how many of these would operate for good, and which and how many for evil is worthy of investigation.

I concluded that but few Cathartics ever obviate torpor, insusceptibility or prostration; and that even these do it so moderately and with so little certainty, that they hardly render this a purpose of Cathartics. I concluded that all Cathartics, during the time of their action, increase the activity of the secernent and absorbent or glandular system; but that none except a small number that are Drastics, and that possess an Adenagic power in addition, ever operate in this manner to a sufficient extent to be valuable for this purpose, in actual practice. I concluded that but very few Cathartics could possibly operate powerfully enough upon the absorbents to be expected to remove pus. I have seen this accomplished however, in a very few instances, by *Ecballium Elaterium*. I concluded that but few of the Cathartics could be expected to produce such a strong impression, or to give such a shock to the system, as to be valuable in therapeutics for this purpose. I became satisfied that all Cathartics exhaust to a greater or less degree, some even that possess no Antiphlogistic power in addition, while others that are quite active, exhaust but very little. This is true of *Ecballium Elaterium* so managed as not to operate Drastically. Certain Cathartics may however be so managed as to deplete efficiently. By the method of giving a single large dose of any very actively Cathartic article, and suffering it to operate six or eight times, or till it ceases spontaneously, efficient depletion, the consequence of the actual removal of matter from the system, will be produced; but the reduction or amount of exhaustion which results is perhaps never in any very exact proportion to the amount of depletion or the removal of matter from the system. For example, much larger discharges may be produced by the Extract of *Ecballium Elaterium* without any material reduction or exhaustion, than can be produced by any other Cathartic with which I am acquainted, perhaps in the whole *materia medica*. As an example very much at variance with this, I may mention the inspissated sap of *Hebræodendron Cambogioides*, probably *Cambogia Gutta* (*Linnaeus*), which reduces or exhausts far more, in proportion to the amount of its evacuation or depletion. And yet, so far as I know, neither of these articles possesses any other power except that of an Aden-

agic, which belongs, as appears to me, in the highest degree, to *Ecbalium Elaterium*. It may therefore be considered as certain that the degree of the reducing or exhausting power of a Cathartic does not depend upon the amount of its evacuant or depleting operation, nor upon the intensity of any non-evacuating and non-exhausting power which it may happen to possess in addition. In regard to this point, the present state of our knowledge does not suggest any better explanation of the fact under consideration than to refer it (as I have already done) to some peculiarity of quality in the occult power upon which Catharsis depends. In fact, I think we should reckon a Cathartic power as intrinsically an exhausting power to a greater or less extent independent of the amount of evacuation or discharge, which the Cathartic agent produces.

How does a simple and pure Cathartic which does not possess a distinct Antiphlogistic power diminish vital energy and strength of action, and prove exhausting in health and in atonic diseases, an effect which is often very obvious in all such cases, and which is still more strikingly manifested in malignant ones? This effect is some times more obvious and more immediate from pure Cathartics than even from Depletion of Blood; and in very malignant cases it is apparent even before the occurrence of any alvine evacuation. This exhausting effect has been attributed to the removal of the "Stimulus of distension," as it is called, from the intestines; or to the removal of the "Stimulus of distension" from the blood-vessels, by the secretion of serum or water into the cavity of the intestines. But from facts and circumstances heretofore stated, there are insuperable objections to the soundness of these views.

Not only atony but malignancy seem to have their seat in the nerve of chymical action, nutrition, etc. Both seem to consist essentially in a peculiar deficiency of vital energy and power of action, i. e. a peculiar lesion of function wholly indescribable by its essential qualities and capable of being known only by its effects. Malignancy seems to differ from atony only in degree, malignancy being a far more intense form of the affection than atony. Now as a matter of observation, and I think I may safely say fact, the first appreciable impression made upon the nerve of chymical action, nutrition, etc. under that grade of condition which

constitutes malignancy, by that occult quality of the Cathartic agent which, a little later, produces Catharsis, undoubtedly occasions a still further exhaustion of the vital energy and power of this nerve. As far as I can judge from the most careful observations, this effect certainly precedes the secretion of air and the secretion of serum into the intestinal canal, and of course the increased peristaltic action, and therefore must be reckoned as the very first grade of the effect of a true and proper Cathartic, and as much produced by the occult quality termed Cathartic, as the above specified secretions and the subsequent increase of peristaltic action. The specific nature and character of the impression occasioning this exhaustion can no more be described and defined in words, than the specific nature and character of any other medicinal impression, such as that which produces a Neuragic, a Euphrenic, or a Tonic effect. It appears to me to be absurd to ascribe the very first grade of the operation of a true and proper Cathartic to its very last effects, viz. the removal of a supposed distension of the intestines by fæces, or a supposed distension of the blood-vessels by serum or water. Without doubt however, the evacuation, which is the ultimate effect of a Cathartic contributes more or less to its exhausting effect, in malignant diseases; and I think that it does it more by depletion of the sanguiferous system, than by the removal of fæces from the lower and larger intestines. But, in my opinion, the greatest mischief results from the first grade of the Cathartic operation just specified.

In all cases, positive Catharsis diminishes vital energy and strength of action, in a greater or less degree according to the article employed, in the heart and blood-vessels, and doubtless also in all the subordinate parts of the nutritive and reproductive systems. This is undoubtedly the fact in all true atonic or asthenic diseases, and also in health. The production of this effect is more difficult and requires an agent with greater exhausting power, and in fact with the addition of an Antiphlogistic power, in entonic diseases than in atonic ones, or in health. It is likewise the fact, that there are agents that produce no material or appreciable exhaustion in health, but which never the less are capable of producing this effect very prominently in a decided atonic or asthenic disease. It may be received as a law, that it requires a considerable greater degree of exhausting power to prove Antiphlogistic, than

it does to exhaust in health ; that it requires a greater degree of this power to exhaust in health, than it does to exhaust in a decided atonic or asthenic disease. It follows therefore, that whatever is capable of proving Antiphlogistic will exhaust in health, and much more in an atonic or asthenic disease. It is important that these facts should be recognized, especially in the treatment of atonic or asthenic diseases. It is well known that Catharsis with whatever agent in a state of health produces exhaustion ; that frequent Catharsis produces so much exhaustion that it can not be tolerated very long with impunity even by the vigorous and robust.

In the selection of a Cathartic for any particular case, the following circumstances in regard to the mode of its operation must be considered.

I. The precise and specific purpose for which the Cathartic is employed. Cathartics are employed for the following different and distinct purposes.

1. For the removal of some noxious, deleterious or otherwise offending matter from the alvine canal, and more especially from the upper and smaller intestines ; or for carrying-off intestinal Eutozoä.

This is a legitimate use of Cathartics whenever the patient is not in such a state of exhaustion as to render the Cathartic more dangerous than the offending matter. For this purpose, a pure Cathartic, i. e. one which has no other medicinal power ; one which will operate speedily ; and one which will affect the whole tract of the intestinal canal about equally, should always be preferred. There is a group of pure Copragogue Cathartics quite certain and speedy in their operation, some of which produce their effects in very small doses and some in comparatively large ones ; and there are individuals belonging to this same group which operate in a great variety of intermediate quantities. These articles have no power in addition to that of a Cathartic, and they affect about equally the whole tract of the alimentary canal. They are therefore exactly adapted to the cases now under consideration.

I have seen patients when under the influence of what are called poisonous Fish, in such a state of exhaustion that I am confident a Cathartic would have endangered life. Now I very well know that the effects of these poisonous Fish may be obviated and remedied without evacuating the Fish-poison. Of this I am well

assured not only from much testimony, but some experience. It is not probable that in any case, its evacuation is absolutely necessary; and probably as many die when it has been evacuated, as when it has not, if the other appropriate remedies are not employed; and if they are employed, the patient recovers if the poison is not evacuated. It is worthy of observation that Fish-poison, like Mushroom-poison, is a relative, not an absolute poison. If a party of a dozen were to eat poisonous Fish, (so called) it is not likely that more than two or three would be morbidly affected by it. It is pretty much so with the poisonous Mushrooms. The effects of these latter may be obviated without evacuating the noxious article, provided other appropriate remedies are efficiently employed. There are many articles commonly called poison, and articles too which are liable to destroy life, if the patient is not properly treated, whose effects may never the less be obviated and perfectly remedied by appropriate measures and agents, even when they are not evacuated from the alvine canal. The cases, in which this is the fact, may be best specified in connexion with individual articles. The same things in the main are true of the external poisoning, (so called) of certain Rhoës. A small number of persons are powerfully affected by them, while they make no impression upon a much larger number; so that they are relative and not absolute poisons.

When Cathartics are given to remove Entozoä intestinalia that have been previously deprived of life, they can not properly be said to be Anthelmintics, since dead Worms will pass-off just as well without Cathartics, but only in a little longer time. But when Cathartics are given to remove Worms that have not previously been deprived of life, they may then be called Anthelmintics. For this purpose, very much such Cathartics are required as would be suitable to remove Poisons, provided we use mere or pure Cathartics, viz. certain, speedy, brisk, but not irritating nor exhausting ones, and also such as will operate about equally upon the whole tract of the intestines. Some of the Narcotic Anthelmintics appear only to stupefy the Worms for a short time, from which they soon recover. When these are employed a Cathartic of the above character must be conjoined in order to accomplish the desired purpose. The two in conjunction are more effectual than either separate.

it d... reducing and Antiphlogistic effect, this... or actively inflammatory diseases. de... of Cathartics in entonic or phlogistic is... great injury in atonic ones, and much... For this purpose, an article should be... hydtragogically, and which possesses and... power in addition. Now we have a large... Cathartics possessing an Antiphlogistic power... degree, and also a Neuragic one, which is... valuable auxiliary for the relief of entonic or phlo... For this second purpose of Cathartics, we should... an article from this group. Although, in such cir... is an important indication to lessen the mass of the... fluid, by evacuating the non-vital serous or watery part... yet it is not sufficient that the article selected should... a Hydragogue. Ecbalium Elaterium is one of the... Hydragogue Cathartics in the materia medica; and... my experience of the character of its Hydragogue opera... it would doubtless aggravate rather than benefit an entonic... phlogistic disease. Does this agent possess any additional... or powers, which produce this aggravation of entonic or... biogistic diathesis? The only other power for which it is ever... used in medicine is that of an Adenagic. I am not apprised that... an Adenagic operation ever aggravates entonic or phlogistic dis... cases, nor that this article possesses any other power. I have always... suspected that its injurious effects in the diseases in question... depend upon peculiarities in the quality of its Hydragogue Cathar... tic power and operation. In this however I may be mistaken; but if I am not, such a fact indicates the importance of studying the peculiar quality of the several powers and operations of the materia medica, as possessed by different articles of the same medicinal class, in reference to a choice of the best article for a specific purpose. Perhaps the aggravating effects of Ecbalium may be referred by some, to what, in vague terms, is called an irritant power; but I know of no irritant operation, that is not the inordinate operation of some one of the powers upon which I have founded my classes. Now all the irritation that I have ever known to be produced by Ecbalium, consists in nausea, retching, an inordinate secretion of air, together with severe tormina, all

resulting from its Cathartic power and operation; and the last of these I always avoid, by giving this agent in doses no larger than a hundredth or a hundred and twentieth of a grain, repeating these four, six or eight times in the twenty-four hours, till there is some threatening of a Cathartic effect, when I immediately suspend its administration, and wait for the desired effect.

3. For the removal of the effused fluid in Dropsies.

This is a very important purpose of Cathartics, and obviously one for which a Hydragogue must be selected, and also an Adenagic. Here an Antiphlogistic and Neuragic Cathartic would clearly be contra-indicated, such as Bitartrate of Potassa, or this Salt in conjunction with Exogonium Purga. The latter, though so commonly employed with the former, does not alone and by itself appear to be at all Hydragogue, unless given in such a quantity as to prove drastic. All Cathartics so managed as to operate drastically are more or less Hydragogue. Again I have known cases of Dropsy, in their last stages, taken out of the charge of an intelligent, judicious and discriminating practitioner, who had employed Ecbalium to as great an extent as was expedient and proper, and put into the hands of a practitioner who did not know any better than to keep the patient under rather an active Diarrhœa by Bitartrate of Potassa, till the Dropsy and the patient went off together. It seemed to be enough to the physician that the remedy was a Hydragogue Cathartic. Its very considerable exhausting power seemed to be considered as a matter of no moment. I have seen dropsical patients gradually sink and die under the Catharsis of Bitartrate of Potassa and Exogonium Purga, that would doubtless have borne not only with impunity, but would have been benefited by as many Cathartics of Ecbalium Elaterium, as any judicious physician would have been at all disposed to administer. As a Hydragogue Cathartic, I believe that Ecbalium Elaterium is the least exhausting article in the materia medica; and Bitartrate of Potassa the most so. The Hydragogue Cathartics then, that are best suited to relieve entonic or phlogistic diseases, would be very ill adapted to the treatment of Dropsy. Now we actually possess a small group of Cathartics that are eminently Hydragogue, and decidedly Adenagic, without any other powers in addition—a group that seems to be designed for the express purpose of the treatment of Dropsy.

4. *a.* For the purpose of increasing susceptibility to the impression of other agents *b.* equalizing the actions of the several moving parts of the system; *c.* changing the secretions and excretions generally, but more particularly those of the alimentary canal, and the collatitious viscera; the whole *d.* as a preparatory process for other remedies, in diseases that are neither phlogistic, nor extremely atonic.

At first thought, these would seem to be four different and distinct purposes; and yet where one of them is supposed to be indicated, the remaining three are commonly supposed to be likewise required. In view of this fact, I have grouped them as only a single purpose of Catharsis, subdividing it into four parts. As appears to me, this, whether considered as a single purpose, or as four different and distinct ones, is never well accomplished by Cathartics. I have no recollection of ever knowing any thing like healthy susceptibility increased in atonic diseases by them. The most that I have ever witnessed has been the production of morbid irritability. Neither have I ever witnessed anything like the equalization of the actions of the several moving parts of the system; nor any change for the better of any of these cretions or excretions, in any atonic disease, by a mere Cathartic operation. I have no knowledge of any individual Cathartic, or any group of Cathartics, that appear to me to be at all adapted to this purpose. I know of no evidence that an increased secretion of air and of serous fluid (instead of a little mucus) into the intestinal canal, and an increase of the peristaltic action (which is the whole of a mere and pure Cathartic operation) ever accomplishes either of these purposes. If we say that these objects are accomplished by Cathartics so managed as to give a sudden shock to the system, or make a strong impression upon it, the purpose is not effected by Catharsis, but by the shock and strong impression. It is then my decided opinion that Catharsis for these purposes should be abandoned, since by mere and pure Catharsis these objects cannot be effected, which, I trust, will be obvious, on a little consideration and reflexion, to every intelligent physician.

5. To give a sudden shock to or make a strong impression upon the system at large, for the purpose of breaking-up, or producing a resolution of certain diseases, which are neither phlogistic, nor materially atonic.

Certain Cathartics may easily be so managed as to give a sudden shock to the system and make a strong impression upon it; but it is not so easy to find the diseases, which this measure or process is well adapted to break-up, or produce a resolution-of. It is not adapted to resolve an entonic or phlogistic disease, because sudden shocks and strong impressions are much better calculated to aggravate entonic or phlogistic diathesis, and all the diseases of which it is a pathological condition, than to relieve or abate them in any degree. On the other hand, a sudden shock or a strong impression, when employed during the stage of predisposition of an atonic acute disease is quite sure to prove a procataretic cause, and to convert the predisposition into whatever disease may happen to be prevalent. In case an atonic acute disease has fairly begun its regular course, it is believed to be very rare that it is capable of resolution by a sudden shock, or a strong impression. It is far oftener liable to be aggravated by it, if nothing worse. I have oftener known it sink the patient to a desperate condition. I have far more frequently known atonic acute diseases resolved by a mild Adenagic Cathartic, with a little Papaver conjoined. Indeed I have seen this measure quite successful in a very considerable number of cases. But even this method is not likely to be successful except in cases in which the atony is moderate, and within a certain range as respects intensity. For a certain number of years, I succeeded very satisfactorily upon this plan; but as the diseases became more atonic, this method began to fail of accomplishing the desired purpose; and when it ceased to do this, it began to do more or less injury. There is a group of Cathartics that are admirably calculated to give a sudden shock to the system, and to make a strong impression upon it, and I have known some of them tried for the purpose of producing a resolution at the outset of certain atonic acute diseases; but whether the cases were too atonic, or the articles not well managed, or the method intrinsically a bad one, I know not, but it was not attended with very satisfactory success.

6. For the mere removal of accumulated fecal matter from the lower and larger intestines.

For this last purpose merely, it is rarely worth while to take a Cathartic into the stomach—it is rarely worth while to disturb the whole tract of the alimentary canal only for the removal of feces

from its lower extremity. In my opinion, under such circumstances, an Enema should always be preferred. An Enema however is generically a Cathartic, but it is one which occasions much less disturbance to the system at large, than a Cathartic taken into the stomach.

II. The degree of its Cathartic effect, i. e. whether it will naturally prove *Eccoprotic*, *Laxative*, *Purgative*, or *Drastic*.

There appears to me to be a natural and just foundation for a division of Cathartics into four groups, according to the degree of their operation, viz.

1. *Eccoprotica* ; i. e. such as merely obviate moderate peristaltic inactivity of the intestines and produce only the natural action.

2. *Laxativa* ; i. e. such as increase peristaltic activity to such a degree only as to occasion the most moderate grade of positive Catharsis or barely evacuate the natural contents of the lower intestines ;

3. *Purgativa* ; i. e. such as not only increase peristaltic activity so as to evacuate the contents of the intestines freely, but also occasion a considerable increase and discharge of the natural secretions that are ordinarily poured into the cavity of the alvine canal ;

4. *Drastica* ; i. e. such as *a.* powerfully augment and change the secretions which are naturally poured into the alvine canal, and (as has been supposed, though I think incorrectly) invert the action of the lacteal absorbents (for there are no other in the intestines) so as to furnish liquid matter for very free discharges, *b.* augment peristaltic activity very greatly, and *c.* make a strong impression not only on the alimentary canal, but on the system generally.

There are numerous articles that can not without the greatest difficulty, if at all, be made to operate otherwise than as *Eccoprotics*, or as *Laxatives*, or as *Purgatives*, or as *Drastics*, i. e. in one of the four degrees ; and there are many more, which in ordinary doses and qualities, and under ordinary management, operate only in one of these degrees, though in inordinate doses and quantities, and under extraordinary management they may be made to produce a higher grade of effect.

III. The ordinary and natural time, which is required for a moderately full Cathartic effect, and more particularly for that which is required for the case under treatment.

Cathartics deserve to be studied and may be usefully grouped

in reference to the time which is required for their operation. The natural time for the operation of a Cathartic is to be estimated by that which is required for the effect of the smallest dose, which alone and by itself will finally produce full Catharsis. The operation of all Cathartics is not only more kind, but far more beneficial, when given in just such doses. The Cathartica citiora, with the exception only of the Antiphlogistic Salts, are seldom of value for any other operation but their Cathartic one; while the Cathartica tardiora frequently render greater service by their other operations, than by their Cathartic one. For want of a proper recognition of its natural slowness of operation one of the most employed of these is seldom so managed as to exert its Cathartic power at all, or to obtain much of its other effects, unless under the management of those who may justly be said to employ it in inordinate doses and quantities, and in this way, they very often experience severe irritant, and other even still less desirable operations. The Cathartica intermedia are much more numerous than either of the other groups, and are much more appropriate for all ordinary purposes.

When a patient is still and quiet, and much more particularly if he is in bed and warm, all Cathartics are thereby rendered slower in their operation and likewise more kind and effectual. Under these circumstances, a less dose will produce full Cathartic effects, and likewise all their other effects upon the system at large. On the contrary, exercise, exposure to the cool air or to vicissitudes of temperature, etc. not only renders their operation more speedy, but also more full. I have on record many clinical observations, that, as I think, would well illustrate the importance of studying Cathartics in reference to the time required for their operation, and that might be a useful guide for their selection in particular cases, besides having them grouped in reference to this point; but nothing of this can be considered or discussed at present.

IV. The part of the alimentary canal, to which the sensations and actions, which it will produce, will be more especially referrible; as *a.* the Stomach; *b.* the Smaller Intestines; *c.* the Larger Intestines; or still more definitely, *d.* the Colon, and *e.* the Rectum.

It is commonly assumed that Cathartics do in fact operate more especially upon those parts of the alimentary canal in which they produce especial sensation; but it is believed that there is fallacy

in this. In some chronic diseases of the intestines I have known a patient very much harrassed with tenesmus, when on post-obit examination, Strumous ulceration of a portion of the mucons membrane of the upper intestines was found, while the lower intestines were perfectly sound. In some malignant cases of Dysentery, under which the patient sunk on the seventh day, and died soon after, I have known great complaint of tenesmus, when on post-obit examination, the larger intestines were found perfectly healthful, and the lining membrane of the smaller intestines in a state of Phlogosis. Numerous parallel cases may easily be specified, as well as others not exactly parallel, but more or less analogous. Every physician knows that the irritation of Worms in the smaller intestines produces itching in the nostrils, or in the lower extremity of the rectum; that Calculus in the urinary bladder occasions pain in the glans penis; and that diseased liver causes pain at the top of the right shoulder. All these are examples of the production of sensation in situations remote from the real seat of irritation.

V. The quality of the discharge, which it will produce, i. e. whether it will prove Copragogue, Hydragogue, Blennagogue, or Cholagogue.

In reference to the quality of the discharges naturally produced by different articles I think that the ancient divisions were not only well founded but worthy of regard in the selection of Cathartics for particular cases and therefore deserving of adoption for the more thorough knowledge of this class of agents and for their better therapeutic application. Cathartics then are 1, Copragoga, i. e. such as produce but little discharge beside fecal matter; 2, Hydragoga, i. e. such as produce very copious watery or serous discharges, with very little fecal matter. Cathartics are Hydragogue in three ways, viz. *a.* intrinsically and independent of Adenagic or Drastic powers; *b.* by virtue of possessing an Adenagic power; and *c.* by virtue of possessing a Drastic power. Any article possessing a combination of two or the whole three of these powers is of course proportionally more Hydragogue. The ancients made two other divisions in reference to the quality of the discharges, viz. 3, Cholagoga, i. e. such as produce a free secretion and discharge of bile or gall or both, along with other matters; and 4, Phlegmagoga or Blennagoga, i. e. such as occasion a secretion and discharge of mucus along with other matters. I presume

that most physicians would admit the former of these two, but would reject the latter. I shall not however discuss this subject at present. Important therapeutic indications require a selection of articles from one or the other of these groups, and I have many clinical observations confirming and substantiating this statement; but I have neither time nor space to treat of this subject any further at present.

VI. The degree, strength, or violence of the impression, that will be made, not only upon the alimentary canal but also upon the system at large.

I have many clinical observations illustrating the evils of neglecting attention to this subject; but as they are more obvious than most of the other circumstances to be regarded in the selection of Cathartics for particular cases, I omit them.

VII. Whether the operation, for the time being, will be peculiarly disagreeable and unkind, or comparatively pleasant.

VIII. Whether the alimentary canal will be left in an improved condition, in the natural state, or in an irritable, weakened, or otherwise disordered condition.

I omit any observations upon the seventh and eighth specifications of circumstances to be regarded in the selection of Cathartics for particular cases, because what I should say, I trust will be sufficiently obvious.

IX. The other specific medicinal operative effects which it will produce, in addition to Catharsis.

One of the most important subjects of consideration in the selection of a Cathartic for a given case is the different and distinct powers which it may happen to possess in addition to its Cathartic power. There are groups of Cathartics which possess in addition all the powers denoted by the associated terms in the following list.

1. Cathartica pura; 2. C. Antiphlogistica; 3. C. Leantica; 4. C. Neuragica; 5. C. Narcotica; 6. C. Erethistica; 7. C. Oræsthetica; 8. C. Tonica; 9. C. Styptica; 10. C. Adenagica; 11. C. Emetica.

There is one additional power possessed by certain Cathartics not mentioned in the preceding list merely because I have no appropriate name for it, viz. an exhausting power which is not an Antiphlogistic one. Some articles possess it only in a moderate degree, while others possess it in a very intense one. The ex-

hanstion which this power in an intense degree produces in a person in health, seems to be greater than that occasioned by the most active Anti-phlogistics; and the same is equally the fact in atonic but non-malignant diseases, and much more in decidedly malignant ones; and yet, strange to say, it is said not to be capable of abating entonic or phlogistic diathesis. It is right however for me to state that I have never myself verified this assertion in regard to the most active articles, but receive it intirely on testimony. To make what I am saying intelligible, I will add that I allude to the exhausting power of *Colchicum autumnale* and other articles nearly allied to it. I have seen the free employment of *Colchicum* for about twelve hours, in a vigorous subject, at the commencement of an attack of *Rheumatismus acutus* without any symptoms of malignancy, sink the patient into the article of death before any degree of Catharsis had taken place. When the Catharsis did occur, it made little difference in the condition of the subject.

There are no Cathartica Stimulantia, in the sense of Antisbestica, as so many authors and practitioners suppose, or as indeed is so universally supposed by the medical profession as a body.

In this mention of the different and distinct powers possessed by Cathartics, my groups are not exactly as they would be if a catalogue of the articles referrible to each were to follow, since in two or three instances, no group with only a single additional power is known, but two or more are possessed by them. As it is not my present plan to give a complete list of all the groups of Cathartics as founded upon the different and distinct powers which they may happen to possess, it will be sufficient to state that there are several other groups distinguished by possessing various combinations of the powers just mentioned.

I will barely mention the synonymy of this class, and leave it without discussion. It is *Catocathartica* or *Downward-Cathartics*, and *Cutoretica* or *Catoterctica* or *articles that cause a flux downward*. These terms are Greek and therefore admissible, but are much less eligible than the term now in common use. *Alviduces* or *Belly-leaders* or *conductors*, and *Dejectoria* or *Castors downward* are Latin, and otherwise very ineligible. The terms *Pur-* and *Purgantia* have been employed as names of this
 but they denote only a grade of Cathartic operation,
 as Lat fore in all respects inadmissible.

CATHARTICA ENEMATA.

Irritating the outer extremity of an excretory by injecting or thrusting any thing into it, always tends to increase discharges from such excretory. This is the principle upon which Enemata prove Cathartic; and upon this principle alone all Enemata always tend to prove Cathartic. But when the process is performed with the least possible irritation, and the quantity of liquid injected is small and mainly composed of some preparation of Papaver, for example, and in sufficient power, the Sedative effects of the Papaver may much more than counterbalance the irritant effect of the process, and restrain Diarrhoic and Dysenteric discharges for the time being. But pretty much every thing but Papaver (though Nicotiana and Datura may be excepted) when employed in this manner tends to increase discharges.

Whenever it is the sole object to clear the lower part of the alvine canal of its fecal contents merely, Cathartic-Enemata are always to be preferred to any other Cathartic, since there is never any accumulation of fecal matter in the upper and smaller intestines, and since it is exceedingly undesirable to disturb the process of chymification in the stomach, of chyli-faction and of lacteal absorption in the upper and smaller intestines, merely for the purpose of clearing the lower and larger intestines. I have sometimes known cases in which there had been no intestinal discharge for a number of days, while the patient had regularly taken a moderate quantity of solid food; and yet the lower part of the lower and larger intestines seemed to be empty, and nothing could be removed by repeated large Enemata. In such circumstances, I have always supposed that there must be an accumulation of fæces in the upper part of the larger and lower intestines, which I have considered as verified, when, by a slow Cathartic, a large discharge of solid fæces has been produced. In such cases an Enema will not answer as a substitute for a Cathartic, even though the mere removal of fæces from the lower and larger intestines is the sole indication for either.

In the case of an adult, a Cathartic Enema should always be administered with a Pump, and not with a Syringe. I never yet saw a Syringe of sufficient capacity and power of injection for the proper quantity of liquid necessary for an efficient Cathartic.

Enema for an adult, or for throwing it far enough into the intestines, and if one were to be made of sufficient size and power, it would probably be unwieldly and not conveniently manageable. It is very frequently the fact that very considerable distension of the intestines so that a liquid injected may pass all around the contained fæces, is necessary for the successful operation of an Enema.

The material of a Cathartic-Enema must, of course, be a liquid, because nothing but a liquid can be injected by a Pump; and that it is a liquid usually answers every purpose. The effect of a Cathartic-Enema is usually produced by the distention and mechanical irritation of its bulk, and its power as a liquid of softening and breaking-down the fæces. If any person chooses it, the addition of any of the liquid and soluble Cathartics may be made to the basis of the Cathartica-Enema, though I think it does no good (Oil of Tiglium may be an exception) or any of them which are capable of imparting their active principles to water, may be infused in the liquid to be employed. But the addition of the ordinary Cathartics to the liquid which is to be employed as the basis of a Cathartic-Enema, increases its Cathartic efficacy but very little, if indeed at all, and certainly much less than might be expected *a priori*; so that such an addition is of very little importance, unless indeed, a much larger quantity of the Cathartic agent is employed than is customary, or than I have ever seen employed. It appears to me that the lower and larger intestines are much less susceptible to that impression and operation by which mere medicinal Cathartics increase the peristaltic action of the upper and smaller intestines. Besides, the copious and watery secretion from the mucous follicles, which they so readily produce in the upper and smaller intestines, but which they are incapable of producing, at least to any appreciable extent, from the lower and larger intestines, undoubtedly operates upon the lower and larger intestines after the manner of the liquid which makes the main bulk of a Cathartic Enema. I think that these considerations will explain the difference between the operation of the medicinal Cathartics when employed in the form of Cathartic-Enemata, and when taken into the stomach.

An Enema of simple tepid water, and of suitable bulk, (*viz.* so large as to produce a decided sense of distension) administered with a suitable instrument (*viz.* a small forcing Pump) will clear

the lower and larger intestines as perfectly and as effectually as a Cathartic, and this without any depletion—any increased secretion from the mucons follicles of the upper and smaller intestines, without any irritation or disturbance of any part of the alimentary canal above the valve of the colon. The instrument is so small that every country practitioner may, without inconvenience, have one always with him; while in a city one may as readily be borrowed from the shop of an apothecary, for little more than a nominal compensation. Indeed the entire cost of the instrument is so inconsiderable that one may be owned by every family possessing competent means of support, while the skill required for its use is less than that necessary for the use of a Syringe. But if one should not happen to be owned by private families generally, it might possibly prevent a great deal of injudicious and even pernicious tampering with disease, by persons intirely incompetent to make even a single judicious prescription.

The employment of a proper Enema for the mere purpose of removing the fecal contents of the lower and larger intestines, at the commencement of a non-malignant atonic fever, interferes with no other measures of treatment which symptoms and circumstances may require, neither occasioning delay in their adoption, nor hindrance to their operation. In the employment of Enemata, instead of Cathartics, at the outset of such fevers, the French are very far in advance of the English, Scotch, Irish and Welch, as well as the people of the United States of North-America. The time occupied in waiting for the operation of a Cathartic (which is always uncertain and variable) at the very outset of a non-malignant atonic fever, when the symptoms are frequently urgent and distressing, and when every half hour is of great importance in reference to the production of a resolution of the disease, is irretrievable; and this loss of time often allows the disease to become fixed, when, without such delay, it might have been arrested. Indeed, when from any circumstance I am constrained to employ a Cathartic instead of a suitable Enema, in the early stage of non-malignant atonic fever, I would not employ it, at the very outset of the disease, but only after twelve, eighteen or twenty-four or more hours' appropriate medication. The employment of a Cathartic at the very outset of such a fever, very often precludes or renders inconvenient any other medication on the one hand; or,

on the other hand, other suitable medication frequently interferes with, or prevents the operation of a Cathartic. In this respect also the French are much in advance of the physicians of Great Britain, and those of the United States of North America.

The utter deficiency, not only of the best, but even of any tolerable apparatus for the proper administration of Enemata, is always a great inconvenience, and often a great evil in the practice of medicine in all parts of the U. S. A. where I happen to be acquainted. The prejudice also that exists in all parts of the U. S. A. in which I have practiced, against all use of Enemata, is not only vexatious and harrassing to physicians, but it is productive of much evil to the sick. It is very often the fact that patients wholly and absolutely refuse to have a Cathartic-Enema; or, the attendants refuse to administer one, when such an Enema is the most decidedly indicative in preference to an ordinary Cathartic taken into the stomach. Under such circumstances, the physician has no alternative; and however much disturbance and mischief a Cathartic taken into the stomach may produce, it must be submitted to. As a general rule, it is in vain to attempt to combat a prejudice of this sort.

Cathartic-Enemata are utterly incapable of answering the first, second, third, fourth and fifth purposes of Catharsis; but they should always be employed for the removal of accumulated fecal matter from the lower and larger intestines. Had we no prejudices against Enemata, were we as much accustomed to them as the French, and did we manage them as dexterously as they do, I presume that purging specifically would rarely be necessary for the mere discharge of feces from the lower and larger intestines, or would rarely be even proper in any decided atonic acute disease. Eccoprotics and laxatives might be useful, their place not being often capable of being supplied by Enemata. The place of the Hydragogue Drastics such *Ecbalium Elaterium*, *Luffa operculata*, etc. can not of course be in any degree supplied by Enemata.

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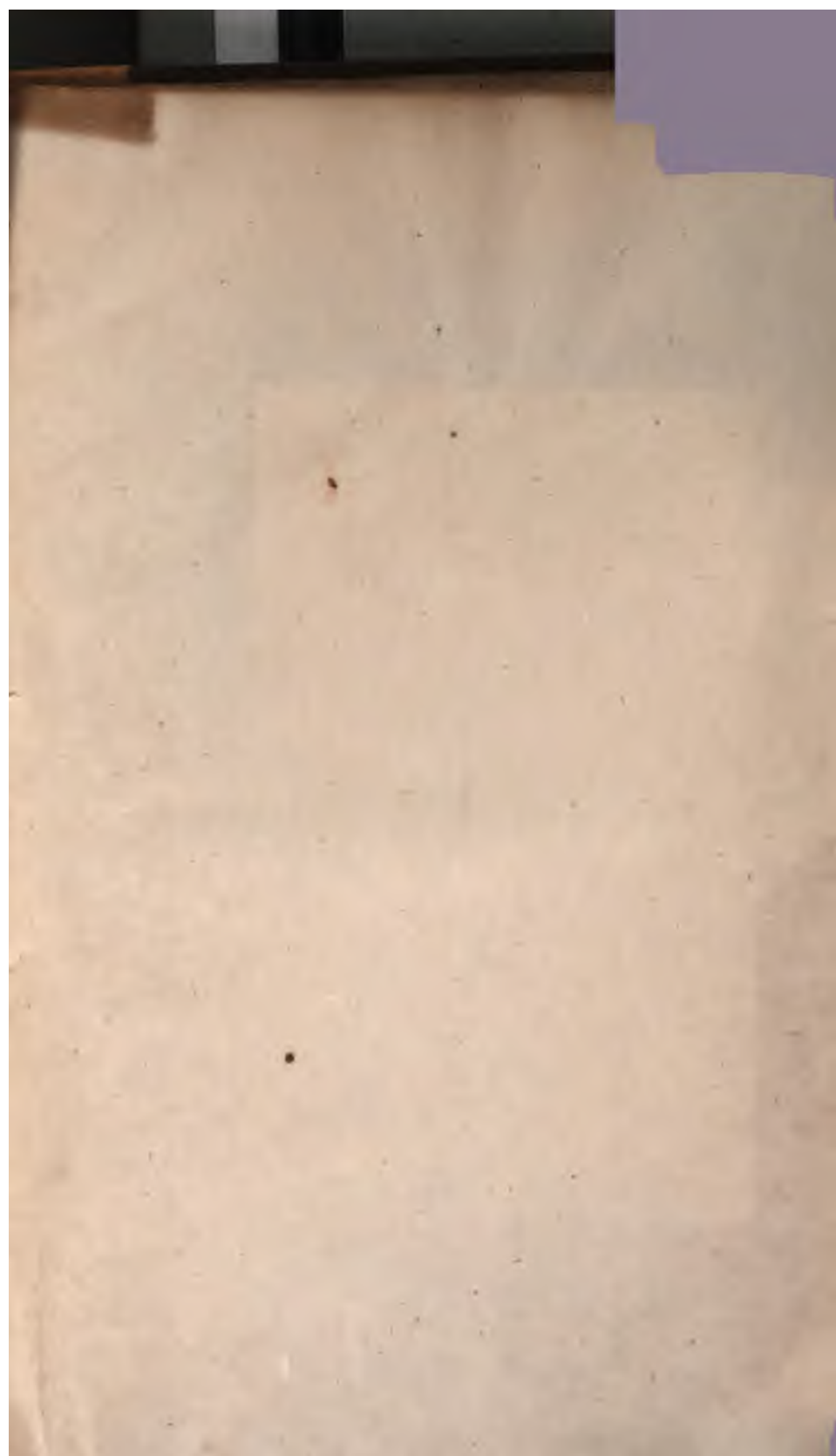
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